

Fig. 1: Verification of differential expression of HIF3alpha splice variant 1 by quantitative RT-PCR

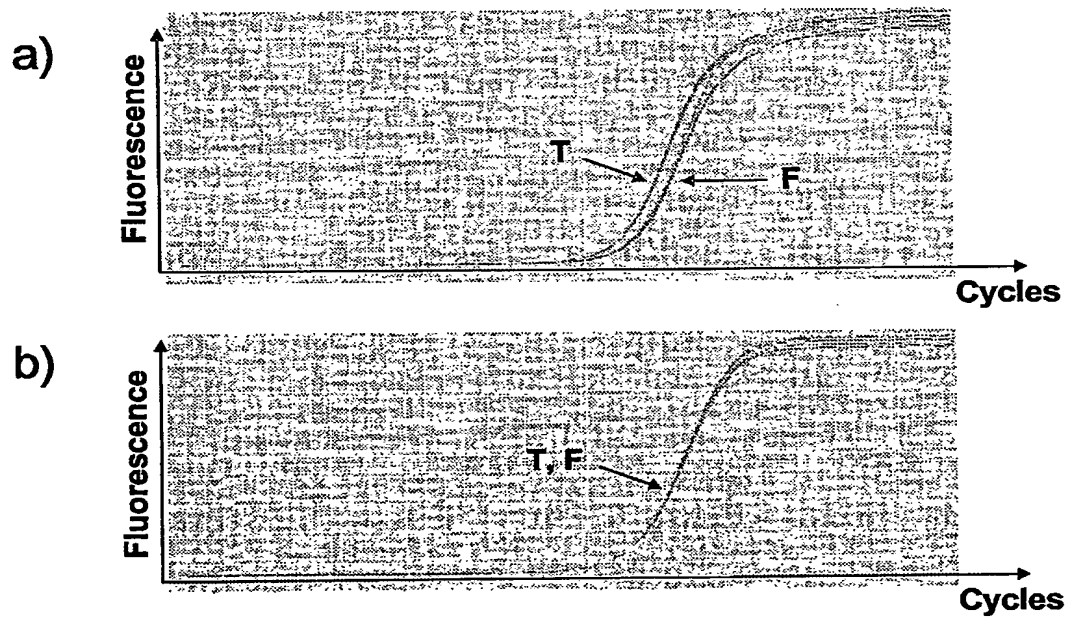


Fig. 2: Verification of differential expression of HIF3alpha splice variant 1 by quantitative RT-PCR

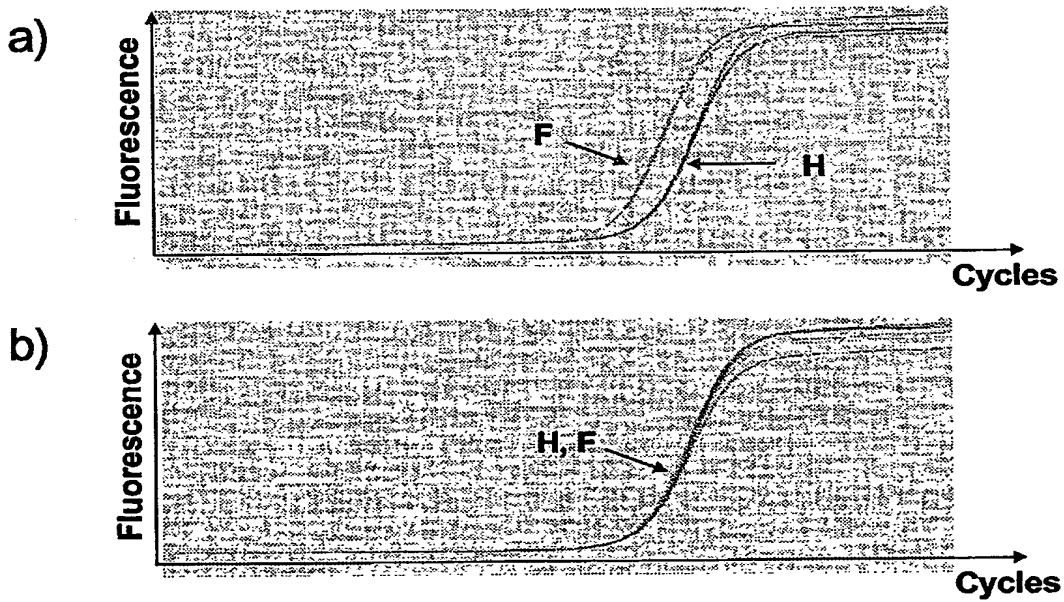


Fig. 3: Verification of differential expression of HIF3alpha splice variant 2 by quantitative RT-PCR

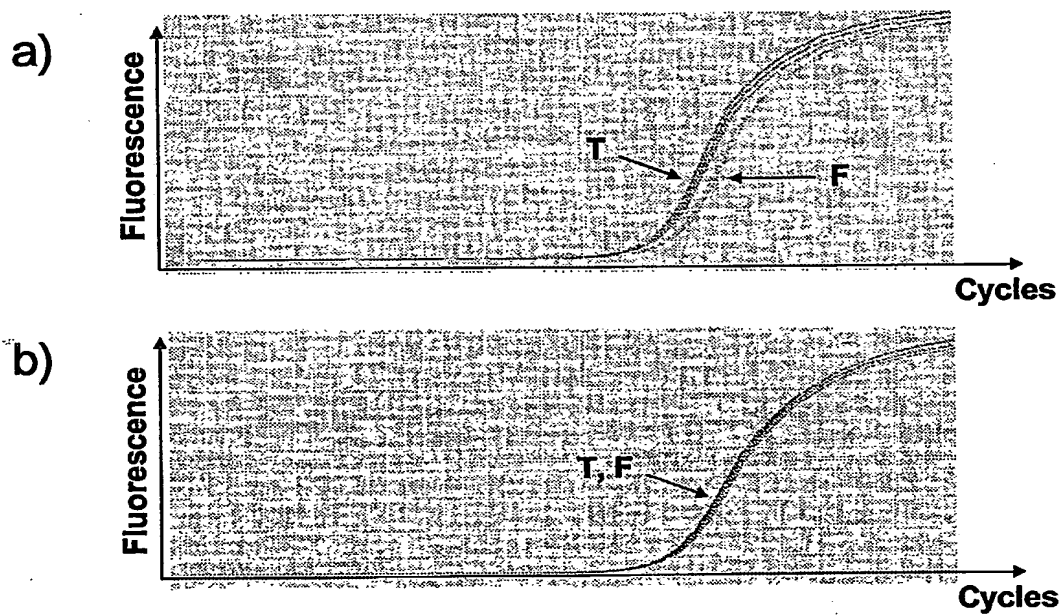


Fig. 4: Verification of differential expression of HIF3alpha splice variant 3 by quantitative RT-PCR

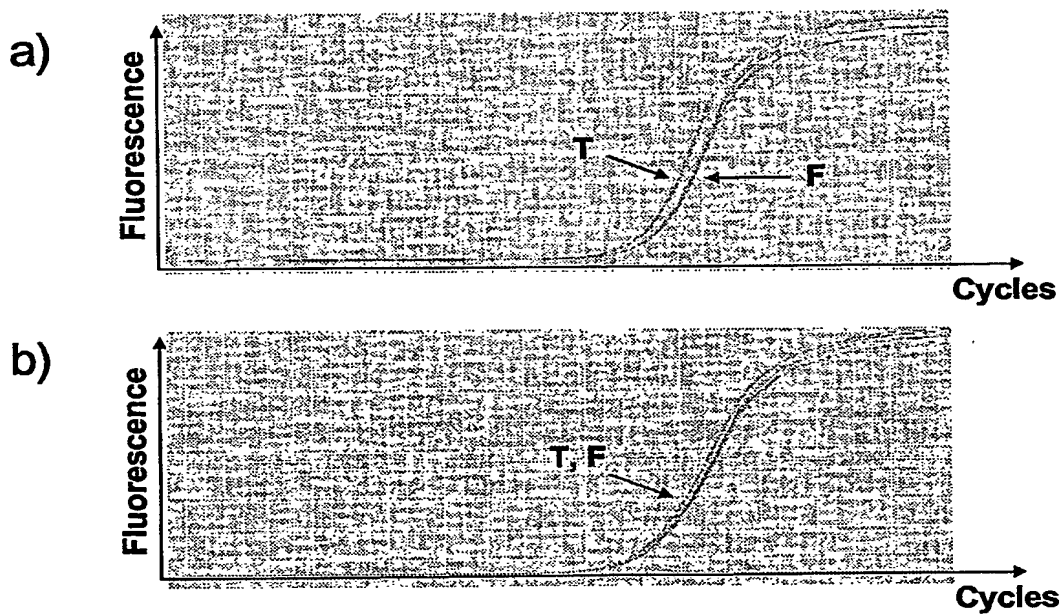


Fig. 5: Verification of differential expression of HIF3alpha splice variant 5 by quantitative RT-PCR

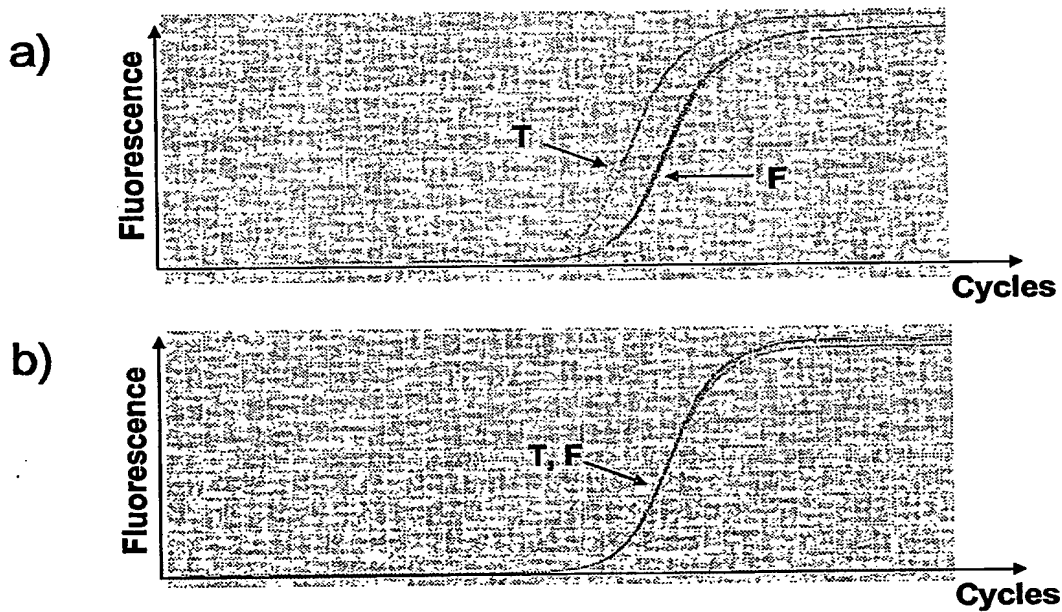


Fig. 6: SEQ ID NO. 1**Length: 289 bp**

```
1  CATTATGAG AGTTTATTCA TTCAAAACAT ATTTACTGTC GGGCGTGGTG
51 GTTCATACCA GTAATCCCAG CACTTTGGGA GGCCAAGGCA GGTGGATCGC
101 TTGAACTCAG GAGTTCAAGA CCAGCCTGGG CAACATGGTG GAACTTCGTC
151 TCTACAAAAC ATATAAACAT CAGCCAGGCA TGATGGCACA TAGCTGCAGT
201 CCCAGCTACT TGTGGGAGCT GAAGTAGGAG GATCACTTGA GCCCAGGAGG
251 TCGAGGCTGT GGTGAGCTGT GTTTGTGCCA CTGCACTCC
```

**Fig. 7: Alignment of SEQ ID NO. 1
with human HIF3alpha splice variant sv1 cDNA,
SEQ ID NO. 6**

```
289 GGAGTGCAGTGGCACAAACACAGCTCACCACAGCCTCGACCTCCTGGGCT 240
    |||||||||||||||||||||||||||||||||||||||||||||||
1421 GGAGTGCAGTGGCACAAACACAGCTCACCACAGCCTCGACCTCCTGGGCT 1470

239 CAAGTGATCCTCCTACTTCAGCTCCCACAAGTAGCTGGGACTGCAGCTAT 190
    |||||||||||||||||||||||||||||||||||||||||||||||
1471 CAAGTGATCCTCCTACTTCAGCTCCCACAAGTAGCTGGGACTGCAGCTAT 1520

189 GTGCCATCATGCCTGGCTGATGTTTATATGTTTGTAGAGACGAAGTTCC 140
    |||||||||||||||||||||||||||||||||||||||||||||
1521 GTGCCATCATGCCTGGCTGATGTTTATATGTTTGTAGAGACGAGGTTTC 1570

139 ACCATGTTGCCCAGGCTGGTCTTGAACCTCTGAGTTCAAGCGATCCACCT 90
    |||||||||||||||||||||||||||||||||||||||||||||
1571 ACCATGTTGCCCAGGCTGGTCTTGAACCTCTGAGTTCAAGCGATCCACCT 1620

89 GCCTTGGCCTCCCAAAGTGCTGGGATTACTGGTATGAACCACCACGCCCCG 40
    |||||||||||||||||||||||||||||||||||||||||||||
1621 GCCTTGGCCTCCCAAAGTGCTGGGATTACTGGTATGAACCACCACGCCCCG 1670

39 ACAGTAAATATGTTTTGAATGAATAAACTCTCATAAATG 1
    ||||||||||||||||||||||||||||||||||||||||
1671 ACAGTAAATATGTTTTGAATGAATAAACTCTCATAAATG 1709
```

**Figure 8: SEQ ID NO. 2:
amino acid sequence of
human HIF3alpha,
splice variant 1**

Length: 450 aa

```
1 MRPAAGAARR PRCCTSWLTR CPSPAASAPT WTRPLSCASP SATCACTASA
51 PQLELIGHSI FDFIHPCDQE ELQDALTPQQ TLSRRKVEAP TERCFSLRMK
101 STLTSRGRTL NLKAATWKVL NCSGHMRAYK PPAQTSPAGS PDSEPPLQCL
151 VLICEAIPHP GSLEPPLGRG AFLSRHSLDM KFTYCDDRIA EVAGYSPDDL
201 IGCSAYEYIH ALDSDAVSKS IHTLLSKGQA VTGQYRFLAR SGGYLWTQTQ
251 ATVVSGGRGP QSESIVCVHF LISQVEETGV VLSLEQTEQH SRRPIQRGAP
301 SQKDTNPBGD SLDTPGPRIL AFLHPPSLSE AALAADPRRF CSPDLRRLLG
351 PILDGASVAA TPSTPLATRH PQSPLSADLP DELPVGTENV HRLFTSGKDT
401 EAVETDL DIA QDPSTPLLNL NEPLGFHFVT QSGVQWHKHS SPQPRPPGLK
```


Fig. 9: SEQ ID NO. 3:
amino acid sequence of
human HIF3alpha,
splice variant 2

Length: 342 aa

```
1 MALGLQRARS TTELRKEKSR DAARSRRSQE TEVLYQLAHT LPFARGVSAH
51 LDKASIMRLT ISYLRMHRLC AAGEWNQVGA GGEPLDACYL KALEGFVMVL
101 TAEGDMAYLS ENVSKHLGLS QLELIGHSIF DFIHPCDQEE LQDALTPQQT
151 LSRRKVEAPT ERCFSLRMKS TLTSRGRTLN LKAATWKVLN CSGHMRAYKP
201 PAQTSPAGSP DSEPPLQCLV LICEAIPHPG SLEPPLGRGA FLSRHSLDMK
251 FTYCDDRIAE VAGYSPDDLI GCSAYEYIHA LDSDAVSKSI HTLLSKGQAV
301 TGQYRFLARS GGYLWTQTQA TVVSGGRGPQ SESIVCVHFL IR
```

Fig. 10: SEQ ID NO. 4:
amino acid sequence of
human HIF3alpha,
splice variant 3

Length: 632 aa

```
1 MALGLQRARS TTELKREKSR DAARSRRSQE TEVLYQLAHT LPFARGVSAH
51 LDKASIMRLT ISYLRMHRLC AAGEWNQVGA GGEPLDACYL KALEGFVMVL
101 TAEGDMAYLS ENVSKHLGLS QLELIGHSIF DFIHPCDQEE LQDALTPQQT
151 LSRRKVEAPT ERCFSLRMKS TLTSRGRTLN LKAATWKVLN CSGHMRAYKP
201 PAQTSPAGSP DSEPPLQCLV LICEAIPHPG SLEPPLGRGA FLSRHSIDMK
251 FTYCDDRIAE VAGYSPDDLI GCSAYEYIHA LDSDAVSKSI HTLLSKGQAV
301 TGQYRFLARS GGYLWTQTQA TVVSGGRGPQ SESIVCVHFL ISQVEETGVV
351 LSLEQTEQHS RRPIQRGAPS QKDTPNPGDS LDTPGPRILA FLHPPSLSEA
401 ALAADPRRFC SPDLRRLGSP ILDGASVAAT PSTPLATRHP QSPLSADLPD
451 ELPVGTENVH RLFTSGKDTA AVETDLIDIAQ DADALDLEML APYISMDDDF
501 QLNASEQLPR AYHRPLGAVP RPRARSFHGL SPPALEPSLL PRWGSDPRLS
551 CSSPSRGDPS ASSPMAGARK RTLAQSSSEDE DEGVELLGVR PPKRSPSPEH
601 ENFLLFPLSL VCWGINGILW PSLPSWLKPT VL
```

Fig. 11: SEQ ID NO. 5:
amino acid sequence of
human HIF3alpha,
splice variant 5

Length: 648 aa

```
1  MRLTISYLRM  HRLCAAGEWN  QVGAGGEPLD  ACYLKALEGF  VMVLTAEADM
51  AYLSENVSKH  LGLSQLELIG  HSIFDFIHPC  DQEELQDALT  PQQTLRRLKV
101  EAPTERCFSL  RMKSTLTSRG  RTLNLKAATW  KVLNCSGHRM  AYKPPAQTSP
151  AGSPDSEPP  QCLVLICEAI  PHPGSLEPPL  GRGAFLSRHS  LDMKFTYCDD
201  RIAEVAGYSP  DDLIGCSAYE  YIHALDSDAV  SKSIHTLLSK  GQAVTGQYRF
251  LARSGGYLWT  QTQATVVSGG  RGPQSESIVC  VHFLISQVEE  TGVVLSLEQT
301  EQHSRRPIQR  GAPSQKDTNP  PGDSLDTPGP  RILAFHPPS  LSEAALAADP
351  RRFCSPLRR  LLGPILDGAS  VAATPSTPLA  TRHPQSPLSA  DLPDELPGVT
401  ENVHRLFTSG  KDTEAVETDL  DIAQDADALD  LEMLAPEYIS  DDDFQLNASE
451  QLPRAYHRPL  GAVPRPRARS  FHGLSPPALE  PSLLPRWGSD  PRLSCSSPSR
501  GDPSASSPMA  GARKRTLAQS  SEDEDEGVLE  LGVRPPKRSP  SPEHENFLLF
551  PLSLSFLLTG  GPAPGSLQDP  TELTQFLLSV  LSFPIIDPYP  LGCAAPGLHA
601  SPFSLPTISV  PQNPLHFPPQ  PSRHALLTLT  PHMFGAPGAP  SPLGWFAI
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Fig. 12: SEQ ID NO. 6:
nucleotide sequence of human HIF3alpha cDNA,
splice variant 1

Length: 1709 bp

```
1  ACTCGTAACT  CGCACCCGGG  TCCTGGCTGC  ACCGCATCCC  CTCCTGCACC
51  CCCTGGATGG  CCCTTCAGCC  AACGGGGGCC  TGGGCGATGG  TCGACCACGG
101 AGCTGCGCAA  GGAAAAGTCC  CGGGATGCGG  CCCGCAGCCG  GCGCAGCCAG
151 GAGACCGAGG  TGCTGTACCA  GCTGGCTCAC  ACGCTGCCCT  TCGCCCGCGG
201 CGTCAGCGCC  CACCTGGACA  AGGCCTCTAT  CATGCGCCTC  ACCATCAGCT
251 ACCTGCGCAT  GCACCGCCTC  TGCGCCGCGG  CTGGAGCTCA  TTGGACACAG
301 CATCTTTGAT  TTCATCCACC  CCTGTGACCA  AGAGGAGCTT  CAGGACGCCC
351 TGACCCCCCA  GCAGACCCCT  TCCAGGAGGA  AGGTGGAGGC  CCCCACGGAG
401 CGGTGCTTCT  CCTTGCGCAT  GAAGAGTACA  CTCACCAGCC  GCGGGCGCAC
451 CCTCAACCTC  AAGGCGGCCA  CCTGGAAGGT  GCTGAACTGC  TCTGGACATA
501 TGAGGGCCTA  CAAGCCACCT  GCGCAGACTT  CTCCAGCTGG  GAGCCCTGAC
551 TCAGAGCCCC  CGCTGCAGTG  CCTGGTGCTC  ATCTGCGAAG  CCATCCCCCA
601 CCCAGGCAGC  CTGGAGCCCC  CACTGGGCCG  AGGGGCCTTC  CTCAGCCGCC
651 ACAGCCTGGA  CATGAAGTTC  ACCTACTGTG  ACGACAGGAT  TGCAGAAAGT
701 GCTGGCTATA  GTCCCGATGA  CCTGATCGGC  TGTTCGCTCT  ACGAGTACAT
751 CCACGCGCTG  GACTCCGATG  CGGTCAGCAA  GAGCATCCAC  ACCTTGCTGA
801 GCAAGGGCCA  GGCAGTAACA  GGGCAGTATC  GCTTCCTGGC  CCGGAGTGGT
851 GGCTACCTGT  GGACCCAGAC  CCAGGCCACA  GTGGTGTGAG  GGGGACGGGG
901 CCCCCAGTCG  GAGAGTATCG  TCTGTGTCCA  TTTTTTAATC  AGCCAGGTGG
951 AAGAGACCGG  AGTGGTGCTG  TCCCTGGAGC  AAACGGAGCA  ACACTCTCGC
1001 AGACCCATTC  AGCGGGGCGC  CCCCTCTCAG  AAGGACACCC  CTAACCCCTG
1051 GGACAGCCTT  GACACCCCTG  GCCCCCGGAT  CCTTGCCTTC  CTGCACCCGC
1101 CTTCCCTGAG  CGAGGCTGCC  CTGGCCGCTG  ACCCCCGCCG  TTTCTGCAGC
1151 CCTGACCTCC  GTCGCCTCCT  GGGACCCATC  CTGGATGGGG  CTTCACTAGC
1201 AGCCACTCCC  AGCACCCCGC  TGGCCACACG  GCACCCCCAA  AGTCCCTCTT
1251 CGGCTGATCT  CCCAGATGAA  CTACCTGTGG  GCACCGAGAA  TGTGCACAGA
1301 CTCTTCACCT  CCGGGAAAGA  CACTGAGGCA  GTGGAGACAG  ATTTAGATAT
1351 AGCTCAGGAC  CCCAGCACCC  CACTCCTGAA  CCTGAATGAG  CCCCTGGGTT
1401 TTCACTTTGT  CACCCAGTCT  GGAGTGCAGT  GGCACAAACA  CAGCTCACCG
1451 CAGCCTCGAC  CTCCTGGGCT  CAAGTGATCC  TCCTACTTCA  GCTCCCACAA
1501 GTAGCTGGGA  CTGCAGCTAT  GTGCCATCAT  GCCTGGCTGA  TGTTTATATG
1551 TTTTGTAGAG  ACGAGGTTTC  ACCATGTTGC  CCAGGCTGGT  CTTGAACTCC
1601 TGAGTTC AAG  CGATCCACCT  GCTTGGCCT  CCCAAAGTGC  TGGGATTACT
1651 GGTATGAACC  ACCACGCCCG  ACAGTAAATA  TGTTTTGAAT  GAATAAACTC
1701 TCATAAATG
```

Fig. 13: SEQ ID NO. 7:
nucleotide sequence of
human HIF3alpha cDNA,
splice variant 2

Length: 2239 bp

```
1  TGGGAGCGGC  GACTGGCGAG  CCATGGCGCT  GGGGCTGCAG  CGCGCAAGGT
51  CGACCACGGA  GCTGCGCAAG  GAAAAGTCCC  GGGATGCGGC  CCGCAGCCGG
101 CGCAGCCAGG  AGACCGAGGT  GCTGTACCAG  CTGGCTCACA  CGCTGCCCTT
151 CGCCCGCGGC  GTCAGCGCCC  ACCTGGACAA  GGCCTCTATC  ATGCGCCTCA
201 CCATCAGCTA  CCTGCGCATG  CACCGCCTCT  GCGCCGCAGG  GGAGTGGAAAC
251 CAGGTGGGAG  CAGGGGGAGA  ACCACTGGAT  GCCTGCTACC  TGAAGGCCCT
301 GGAGGGCTTC  GTCATGGTGC  TCACCGCCGA  GGGAGACATG  GCTTACCTGT
351 CGGAGAATGT  CAGCAAACAC  CTGGGCCTCA  GTCAGCTGGA  GCTCATTGGA
401 CACAGCATCT  TTGATTTTCA  CCACCCCTGT  GACCAAGAGG  AGCTTCAGGA
451 CGCCCTGACC  CCCCAGCAGA  CCCTGTCCAG  GAGGAAGGTG  GAGGCCCCCA
501 CGGAGCGGTG  CTTCTCCTTG  CGCATGAAGA  GTACGCTCAC  CAGCCGCGGG
551 CGCACCCCTCA  ACCTCAAGGC  GGCCACCTGG  AAGGTGCTGA  ACTGCTCTGG
601 ACATATGAGG  GCCTACAAGC  CACCTGCGCA  GACTTCTCCA  GCTGGGAGCC
651 CTGACTCAGA  GCCCCGCTG  CAGTGCCCTG  TGCTCATCTG  CGAAGCCATC
701 CCCACCCAG  GCAGCCTGGA  GCCCCCACTG  GGCCGAGGGG  CCTTCCTCAG
751 CCGCCACAGC  CTGGACATGA  AGTTCACCTA  CTGTGACGAC  AGGATTGCGAG
801 AAGTGGCTGG  CTATAGTCCC  GATGACCTGA  TCGGCTGTTC  CGCCTACGAG
851 TACATCCACG  CGCTGGACTC  CGACGCGGTC  AGCAAGAGCA  TCCACACCTT
901 GCTGAGCAAG  GGCCAGGCAG  TAACAGGGCA  GTATCGCTTC  CTGGCCCCGA
951 GTGGTGGCTA  CCTGTGGACC  CAGACCCAGG  CCACAGTGGT  GTCAGGGGGA
1001 CGGGGCCCCC  AGTCGGAGAG  TATCGTCTGT  GTCCATTTTT  TAATCAGGTA
1051 AGCAGGAGGA  GGGGCTGGGG  TGGCTGTGTG  TGGGCTGAT  GTGCATGTGT
1101 GGACAGGTGT  GTGTGTGTGT  GTGTGTGTGT  GTGTGTGTGT  GCGTATGAGC
1151 ATGCATGTGT  ATCATGCATA  AGTGTATGTG  AGGGAGTGTG  CACGTGTACA
1201 CATATGAGGA  ATGTGTGTCA  CCATGTAAAT  GCCGGTGTGT  GTGTCTGCAT
1251 GGACACAGGT  ATGTGTATGG  GTGTGTAGAC  TGTAAATTTT  TTTTTTTTTT
1301 TTTTTTTGCG  TGAACCTCTG  CTTAAGTGGA  TTGTTAATTC  AAATTAGAAA
1351 GGGGTCCTTA  TTTGGCCTGG  CATGGTGGCT  CATGCCTGTA  ATCCTAGCAC
1401 TTTGGGAGGC  TGAGGTGGGC  GGATTGCCTG  AGCTCAGGAG  TTCGAAACCA
1451 GCCTGGGCAA  CATGACGAAA  TGCTGTTTCT  GCTAATAATA  CCAAAAATTA
1501 GCCGGGTGTG  GTGACACATG  CCTGTGATCC  CAACTACTCG  GGAGGCTGAG
1551 GCACGAGAAT  CATTAGAACC  CGGCTGGTGG  AGGCTGCAGT  GAGCCGAGAT
1601 TGCGTCAGTG  CACTCTGGCC  TCGGCAACAG  AGCGAGACTC  TGTCTCAAAC
1651 AAACAAACAA  ACAAACAAAA  GGACTCTATA  TTCAAGTTAA  AATAAGAAGT
1701 GTAACAGAAT  CATGGGGTCT  TTTTGTGCTT  TTAAATTTTG  ATGTGGCTCA
1751 CGCCTGTAAA  TCCCAAGGTG  TTGGGATTAC  AGGCGTGAGC  CACTGCACCC
1801 GGCCCATGTT  GTGGTTTATA  TCAGTAGTTC  CTTTGTAAAT  AGTGAACAGT
1851 ATTCCATGGT  ATGAATAGAG  CACAGTTTTT  TTTTTTATCC  ATTCACCAGT
1901 TAGAAGACAT  TGGGCTGTTT  CCAAGTTTGG  GTGATTACAA  AAAACAGCTA
1951 CTGTAAACAT  TCTCATACAA  GATTTTATGA  GATCACATGT  TTTTATTCTT
2001 CTTGGGTAAA  CAGCTAGGAT  TGGAAATGGAT  GGGTTATATA  GTAAGTGTAT
2051 ATTTAATCTA  AGAAACTGCC  ATGGCTGGGC  ACAGTGGCTC  ACGCCTGTAA
```

2101 TCCCAGTACT TTGGGAAGCC AAGGAAGGAG GATGACTAGA GCCTCTGAGG
2151 TGAAGACCAG CCTGGGCAAA GTGGTTAAGA CTCAACCGCA AAAAAAGAAA
2201 AACAGAAAAC CTGAAAACAA ACCAAAAAAA AAAAAAAA

Figure 14: SEQ ID NO. 8:
nucleotide sequence of
human HIF3alpha cDNA,
splice variant 3

Length: 2082 bp

```
1  GACTGGCGAG CCATGGCGCT GGGGCTGCAG CGCGCAAGGT CGACCACGGA
51  GCTGCGCAAG GAAAAGTCCC GGGATGCGGC CCGCAGCCGG CGCAGCCAGG
101 AGACCGAGGT GCTGTACCAG CTGGCTCACA CGCTGCCCTT CGCCCGCGGC
151 GTCAGCGCCC ACCTGGACAA GGCCTCTATC ATGCGCCTCA CCATCAGCTA
201 CCTGCGCATG CACCGCCTCT GCGCCGCAGG GGAGTGGAAC CAGGTGGGAG
251 CAGGGGGAGA ACCACTGGAT GCCTGCTACC TGAAGGCCCT GGAGGGCTTC
301 GTCATGGTGC TCACCGCCGA GGGAGACATG GCTTACCTGT CGGAGAATGT
351 CAGCAAACAC CTGGGCCTCA GTCAGCTGGA GCTCATTGGA CACAGCATCT
401 TTGATTTCAT CCACCCCTGT GACCAAGAGG AGCTTCAGGA CGCCCTGACC
451 CCCCAGCAGA CCCTGTCCAG GAGGAAGGTG GAGGCCCCCA CGGAGCGGTG
501 CTTCTCCTTG CGCATGAAGA GTACGCTCAC CAGCCGCGGG CGCACCCCTCA
551 ACCTCAAGGC GGCCACCTGG AAGGTGCTGA ACTGCTCTGG ACATATGAGG
601 GCCTACAAGC CACCTGCGCA GACTTCTCCA GCTGGGAGCC CTGACTCAGA
651 GCCCCCGCTG CAGTGCCTGG TGCTCATCTG CGAAGCCATC CCCCACCCAG
701 GCAGCCTGGA GCCCCCACTG GGCCGAGGGG CCTTCCTCAG CCGCCACAGC
751 CTGGACATGA AGTTCACCTA CTGTGACGAC AGGATTGTCAG AAGTGGCTGG
801 CTATAGTCCC GATGACCTGA TCGGCTGTTC CGCCTACGAG TACATCCACG
851 CGCTGGACTC CGACGCGGTC AGCAAGAGCA TCCACACCTT GCTGAGCAAG
901 GGCCAGGCAG TAACAGGGCA GTATCGCTTC CTGGCCCGGA GTGGTGGCTA
951 CTTGTGGACC CAGACCCAGG CCACAGTGGT GTCAGGGGGA CGGGGCCCCC
1001 AGTCGGAGAG TATCGTCTGT GTCCATTTTT TAATCAGCCA GGTGGAAGAG
1051 ACCGGAGTGG TGCTGTCCCT GGAGCAAACG GAGCAACACT CTCGCAGACC
1101 CATTCAGCGG GGCGCCCCCT CTCAGAAGGA CACCCCTAAC CTTGGGGACA
1151 GCCTTGACAC CCCTGGCCCC CGGATCCTTG CCTTCCTGCA CCCGCCTTCC
1201 CTGAGCGAGG CTGCCCTGGC CGCTGACCCC CGCCGTTTCT GCAGCCCTGA
1251 CTTCCGTCGC CTCCTGGGAC CCATCCTGGA TGGGGCTTCA GTAGCAGCCA
1301 CTCCCAGCAC CCCGCTGGCC ACACGGCACC CCCAAAGTCC TCTTTCGGCT
1351 GATCTCCAG ATGAATACTG TGTGGGCACC GAGAATGTGC ACAGACTCTT
1401 CACCTCCGGG AAAGACACTG AGGCAGTGGA GACAGATTTA GATATAGCTC
1451 AGGATGCTGA TGCTCTGGAT TTGGAGATGC TGGCCCCCTA CATCTCCATG
1501 GATGATGACT TCCAGCTCAA CGCCAGCGAG CAGCTACCCA GGGCCTACCA
1551 CAGACCTCTG GGGGCTGTCC CCCGGCCCCG TGCTCGGAGC TTCCATGGCC
1601 TGTCACCTCC AGCCCTTGAG CCCTCCCTGC TACCCCGCTG GGGGAGTGAC
1651 CCCC GGCTGA GCTGCTCCAG CCCTTCCAGA GGGGACCCCT CAGCATCCTC
1701 TCCCATGGCT GGGGCTCGGA AGAGGACCCCT GGCCAGAGC TCAGAGGACG
1751 AGGACGAGGG AGTGGAGCTG CTGGGAGTGA GACCTCCCAA AAGGTCCCCC
1801 AGCCCAGAAC ACGAAAACCT TCTGCTCTTT CCTCTCAGCC TGGTGTGTTG
1851 GGGGATTAAT GGGATTCTCT GGGCCTCATT ACCTAGCTGG CTTAAACCTA
1901 CTGTTTTATA GATAGGAAAC CAGAGAGGGG CAGGGGCTGG TTGAGGGTCA
1951 TACAGAAAGT CAGTGGGCCA GCTGAGACTA AAGCCTGATC TTCTAGTTTC
2001 ACTAATGGGT ATTAATAACC TCTGCAGTGA ACTGAGATTG CGCCACTGCA
2051 CCCCAGCATG AGCGACAGAA TGGGACCTTG TC
```

Figure 15: SEQ ID NO. 9:
nucleotide sequence of
human HIF3alpha cDNA,
splice variant 5

Length: 2595 bp

```
1  AACTCGCACC CGGGTCCTGG CTGCACCGCA TCCCCTCCTG CACCCCTGG
51 ATGGCCCTTC AGCCAACGGG GGCCTGGGCG ATGGTCCGACC ACGGAGCTGC
101 GCAAGGAAAA GTCCCGGGAT GCGGCCCGCA GCCGGCGCAG CCAGGAGACC
151 GAGGTGCTGT ACCAGCTGGC TCACACGCTG CCCTTCGCCC GCGGCGTCAG
201 CGCCACCTG GACAAGGCCT CTATCATGCG CCTCACCATC AGCTACCTGC
251 GCATGCACCG CCTCTGCGCC GCAGGGGAGT GGAACCCAGT GGGAGCAGGG
301 GGAGAACCAC TGGATGCCTG CTACCTGAAG GCCCTGGAGG GCTTCGTCAT
351 GGTGCTCACC GCCGAGGGAG ACATGGCTTA CCTGTCGGAG AATGTCAGCA
401 AACACCTGGG CCTCAGTCAG CTGGAGCTCA TTGGACACAG CATCTTTGAT
451 TTCATCCACC CCTGTGACCA AGAGGAGCTT CAGGACGCCC TGACCCCCCA
501 GCAGACCCTG TCCAGGAGGA AGGTGGAGGC CCCACGGAG CGGTGCTTCT
551 CCTTGCGCAT GAAGAGTACG CTCACCAGCC GCGGGCGCAC CCTCAACCTC
601 AAGGCGGCCA CCTGGAAGGT GCTGAACTGC TCTGGACATA TGAGGGCCTA
651 CAAGCCACCT GCGCAGACTT CTCCAGCTGG GAGCCCTGAC TCAGAGCCCC
701 CGCTGCAGTG CCTGGTGCTC ATCTGCGAAG CCATCCCCCA CCCAGGCAGC
751 CTGGAGCCCC CACTGGGCCG AGGGGCCTTC CTCAGCCGCC ACAGCCTGGA
801 CATGAAGTTC ACCTACTGTG ACGACAGGAT TGCAGAAGTG GCTGGCTATA
851 GTCCCGATGA CCTGATCGGC TGTTCGCGCT ACGAGTACAT CCACGCGCTG
901 GACTCCGACG CGGTGAGCAA GAGCATCCAC ACCTTGCTGA GCAAGGGCCA
951 GGCAGTAACA GGGCAGTATC GCTTCCTGGC CCGGAGTGGT GGCTACCTGT
1001 GGACCCAGAC CCAGGCCACA GTGGTGTCAG GGGGACGGGG CCCCAGTCG
1051 GAGAGTATCG TCTGTGTCCA TTTTFTAATC AGCCAGGTGG AAGAGACCGG
1101 AGTGGTGCTG TCCCTGGAGC AAACGGAGCA ACACTCTCGC AGACCATTTC
1151 AGCGGGGCGC CCCCTCTCAG AAGGACACCC CTAACCCTGG GGACAGCCTT
1201 GACACCCCTG GCCCCGGAT CCTTGCCCTC CTGCACCCGC CTTCCCTGAG
1251 CGAGGCTGCC CTGGCCGCTG ACCCCCGCCG TTTCTGCAGC CCTGACCTCC
1301 GTCGCCTCCT GGGACCCATC CTGGATGGGG CTTCAGTAGC AGCCACTCCC
1351 AGCACCCCGC TGGCCACACG GCACCCCAA AGTCCTCTTT CGGCTGATCT
1401 CCCAGATGAA CTACCTGTGG GCACCGAGAA TGTGCACAGA CTCTTACCT
1451 CCGGGAAGA CACTGAGGCA GTGGAGACAG ATTTAGATAT AGCTCAGGAT
1501 GCTGATGCTC TGGATTGGA GATGCTGGCC CCCTACATCT CCATGGATGA
1551 TGACTTCCAG CTCAACGCCA GCGAGCAGCT ACCCAGGGCC TACCACAGAC
1601 CTCTGGGGGC TGTCCCCCGG CCCCCTGCTC GGAGCTTCCA TGGCCTGTCA
1651 CCTCCAGCCC TTGAGCCCTC CCTGCTACCC CGCTGGGGGA GTGACCCCG
1701 GCTGAGCTGC TCCAGCCCTT CCAGAGGGGA CCCCTCAGCA TCCTCTCCCA
1751 TGGCTGGGGC TCGGAAGAGG ACCCTGGCCC AGAGCTCAGA GGACGAGGAC
1801 GAGGGAGTGG AGCTGCTGGG AGTGAGACCT CCAAAAGGT CCCCAGCCC
1851 AGAACACGAA AACTTTCTCG TCTTTCTCTT CAGCCTGAGT TTCCTTCTGA
1901 CAGGAGGACC AGCCCCAGGG AGCCTGCAGG ACCCCTACTG ACTTACCCAA
1951 TTCCTTCTTT CAGTCTTAAG TTTTCCCATT CTAGACCCCT ACCCTCTAGG
2001 CTGTGCTGCT CCTGGACTTC ATGCCTCTCC ATTCTCATTG CCTACAATCT
2051 CTGTGCCCCA GAACCCCTC CACTtCCCAC CCCAGCCCTC CAGACATGCA
2101 CTTACCTTGA CTTTACCCCA CATGTTTGGG GCACCTGGGG CTCCCTCACC
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2151 CCTTGGGTGG TTGCAATCT GAAGACTTCT CCAGCCACAC AGGCACATGC
2201 ACAGGCACGG TGCTGTCTGC ATATTGCCAG GTGGGGAGAG AAGCCAGGAC
2251 CCCTCAGCTG TCTGCCACCA TCTATGTGCC TCCCTTACCC CCCAGCTTTC
2301 TTTCTACAGA TGGTGCTACT CTTGGTCTCC CACAGGAAAA GGCCCTCCCCC
2351 CTTCTTAGCC CCATTTACCC CGTTTGTGGA AGGCACTGCT CGCTCTGTTT
2401 TGTCAGAGAG TGGCCTATCC AGATTGGTGC TATGGGGGGG TCTGACCCCT
2451 CCCTCCTCCC TCTGGAGGTG ATGTGGGCCC TCAATGGAGG GAATTGTGCT
2501 GGGCTAGGGA AAGGGGAGGG ACTAGACTGG CCACACTGGC TCTGAAACTC
2551 ACCAAtCTCT ATACACCATA AAGACCTCAC CTTGGTAGGC ACCAG

Fig. 16: SEQ ID NO. 10:
nucleotide sequence of human
HIF3alpha splice variant 1
coding sequence

Length: 1353 bp

```
1  ATGCGGCCCCG CAGCCGGCGC AGCCAGGAGA CCGAGGTGCT GTACCAGCTG
51  GCTCACACGC TGCCCTTCGC CCGCGGCGTC AGCGCCCACC TGGACAAGGC
101 CTCTATCATG CGCCTCACCA TCAGCTACCT GCGCATGCAC CGCCTCTGCG
151 CCGCAGCTGG AGCTCATTTG ACACAGCATC TTTGATTTCA TCCACCCCTG
201 TGACCAAGAG GAGCTTCAGG ACGCCCTGAC CCCCAGCAG ACCCTGTCCA
251 GGAGGAAGGT GGAGGCCCCC ACGGAGCGGT GCTTCTCCTT GCGCATGAAG
301 AGTACACTCA CCAGCCGCGG GCGCACCTC AACCTCAAGG CGGCCACCTG
351 GAAGGTGCTG AACTGCTCTG GACATATGAG GGCCTACAAG CCACCTGCGC
401 AGACTTCTCC AGCTGGGAGC CCTGACTCAG AGCCCCCGCT GCAGTGCCTG
451 GTGCTCATCT GCGAAGCCAT CCCCACCCA GGCAGCCTGG AGCCCCCACT
501 GGGCCGAGGG GCCTTCCTCA GCCGCCACAG CCTGGACATG AAGTTCACCT
551 ACTGTGACGA CAGGATTGCA GAAGTGGCTG GCTATAGTCC CGATGACCTG
601 ATCGGCTGTT CCGCCTACGA GTACATCCAC GCGCTGGACT CCGATGCGGT
651 CAGCAAGAGC ATCCACACCT TGCTGAGCAA GGGCCAGGCA GTAACAGGGC
701 AGTATCGCTT CCTGGCCCGG AGTGGTGGCT ACCTGTGGAC CCAGACCCAG
751 GCCACAGTGG TGTGAGGGGG ACGGGGCCCC CAGTCGGAGA GTATCGTCTG
801 TGTCCATTTT TTAATCAGCC AGGTGGAAGA GACCGGAGTG GTGCTGTCCC
851 TGGAGCAAAC GGAGCAACAC TCTCGCAGAC CCATTCAGCG GGGCGCCCCC
901 TCTCAGAAGG ACACCCCTAA CCCTGGGGAC AGCCTTGACA CCCCTGGCCC
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1001 CCGCTGACCC CCGCCGTTTC TGCAGCCCTG ACCTCCGTCG CCTCCTGGGA
1051 CCCATCCTGG ATGGGGCTTC AGTAGCAGCC ACTCCCAGCA CCCCCTGGC
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1151 CTGTGGGCAC CGAGAATGTG CACAGACTCT TCACCTCCGG GAAAGACACT
1201 GAGGCAGTGG AGACAGATTT AGATATAGCT CAGGACCCCA GCACCCCACT
1251 CCTGAACCTG AATGAGCCCC TGGGTTTTCA CTTTGTCAAC CAGTCTGGAG
1301 TGCAGTGGCA CAAACACAGC TCACCGCAGC CTCGACCTCC TGGGCTCAAG
1351 TGA
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Fig. 17: SEQ ID NO. 11:
nucleotide sequence of human
HIF3alpha splice variant 2
coding sequence

Length: 1029 bp

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151 CTGGACAAGG CCTCTATCAT GCGCCTCACC ATCAGCTACC TGC GCATGCA
201 CCGCCTCTGC GCCGCAGGGG AGTGGAAcca GGTGGGAGCA GGGGGAGAAC
251 CACTGGATGC CTGCTACCTG AAGGCCCTGG AGGGCTTCGT CATGGTGCTC
301 ACCGCCGAGG GAGACATGGC TTACCTGTCG GAGAATGTCA GCAAACACCT
351 GGGCCTCAGT CAGCTGGAGC TCATTGGACA CAGCATCTTT GATTTCATCC
401 ACCCCTGTGA CCAAGAGGAG CTTCAGGACG CCCTGACCCC CCAGCAGACC
451 CTGTCCAGGA GGAAGGTGGA GGCCCCACG GAGCGGTGCT TCTCCTTGCG
501 CATGAAGAGT ACGCTCACCA GCCGCGGGCG CACCCTCAAC CTCAAGGCGG
551 CCACCTGGAA GGTGCTGAAC TGCTCTGGAC ATATGAGGGC CTACAAGCCA
601 CCTGCGCAGA CTTCTCCAGC TGGGAGCCCT GACTCAGAGC CCCCCTGCA
651 GTGCCTGGTG CTCATCTGCG AAGCCATCCC CCACCCAGGC AGCCTGGAGC
701 CCCCACTGGG CCGAGGGGCC TTCCTCAGCC GCCACAGCCT GGACATGAAG
751 TTCACCTACT GTGACGACAG GATTGCAGAA GTGGCTGGCT ATAGTCCCGA
801 TGACCTGATC GGCTGTTCCG CCTACGAGTA CATCCACGCG CTGGACTCCG
851 ACGCGGTCAG CAAGAGCATC CACACCTTGC TGAGCAAGGG CCAGGCAGTA
901 ACAGGGCAGT ATCGCTTCCT GGCCCGGAGT GGTGGCTACC TGTGGACCCA
951 GACCCAGGCC ACAGTGGTGT CAGGGGGACG GGGCCCCCAG TCGGAGAGTA
1001 TCGTCTGTGT CCATTTTTTA ATCAGGTAA
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Fig. 18: SEQ ID NO. 12:
nucleotide sequence of human
HIF3alpha splice variant 3
coding sequence

Length: 1899 bp

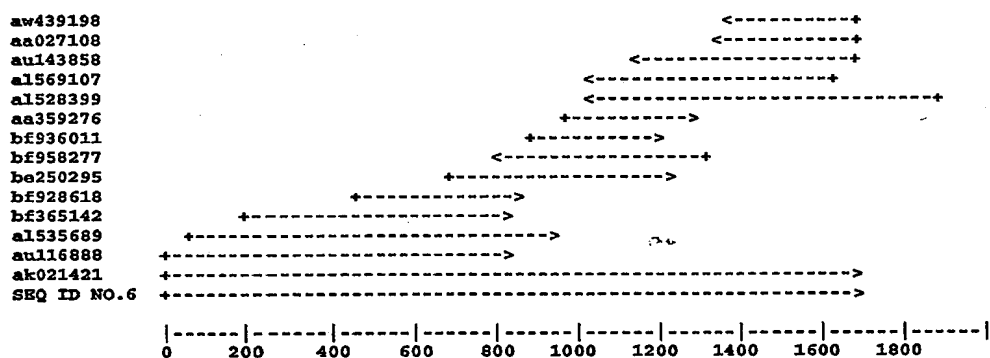
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151 CTGGACAAGG CCTCTATCAT GCGCCTCACC ATCAGCTACC TGCGCATGCA
201 CCGCCTCTGC GCGCAGGGG AGTGGAACCA GGTGGGAGCA GGGGGAGAAC
251 CACTGGATGC CTGCTACCTG AAGGCCCTGG AGGGCTTCGT CATGGTGCTC
301 ACCGCCGAGG GAGACATGGC TTACCTGTCT GAGAATGTCA GCAAACACCT
351 GGGCCTCAGT CAGCTGGAGC TCATTGGACA CAGCATCTTT GATTTCATCC
401 ACCCCTGTGA CCAAGAGGAG CTTCAGGACG CCCTGACCCC CCAGCAGACC
451 CTGTCCAGGA GGAAGGTGGA GGCCCCACG GAGCGGTGCT TCTCCTTGCG
501 CATGAAGAGT ACGCTCACCA GCCGCGGGCG CACCCTCAAC CTCAAGGCGG
551 CCACCTGGAA GGTGCTGAAC TGCTCTGGAC ATATGAGGGC CTACAAGCCA
601 CCTGCGCAGA CTTCTCCAGC TGGGAGCCCT GACTCAGAGC CCCCCTGCA
651 GTGCCTGGTG CTCATCTGCG AAGCCATCCC CCACCCAGGC AGCCTGGAGC
701 CCCCCTGGG CCGAGGGGCC TTCCTCAGCC GCCACAGCCT GGACATGAAG
751 TTCACCTACT GTGACGACAG GATTGCAGAA GTGGCTGGCT ATAGTCCCGA
801 TGACCTGATC GGCTGTTCCG CCTACGAGTA CATCCACGCG CTGGACTCCG
851 ACGCGGTCAG CAAGAGCATC CACACCTTGC TGAGCAAGGG CCAGGCAGTA
901 ACAGGGCAGT ATCGCTTCCT GGCCCGGAGT GGTGGCTACC TGTGGACCCA
951 GACCCAGGCC ACAGTGGTGT CAGGGGGACG GGGCCCCCAG TCGGAGAGTA
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1801 GAAAACCTTC TGCTCTTTCC TCTCAGCCTG GTGTGTTGGG GGATTAATGG
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Fig. 19: SEQ ID NO. 13:
nucleotide sequence of human
HIF3alpha splice variant 5
coding sequence

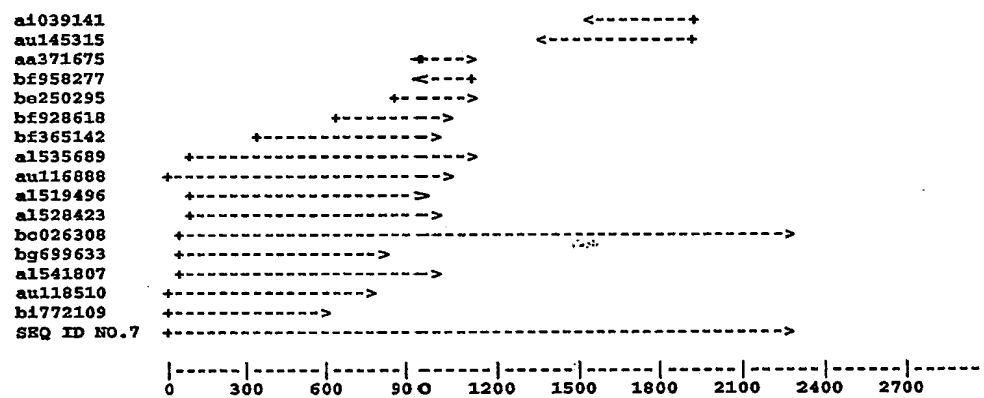
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151 GCTTACCTGT CGGAGAAATGT CAGCAAACAC CTGGGCCTCA GTCAGCTGGA
201 GCTCATTTGA CACAGCATCT TTGATTTTCAT CCACCCCTGT GACCAAGAGG
251 AGCTTCAGGA CGCCCTGACC CCCAGCAGA CCCTGTCCAG GAGGAAGGTG
301 GAGGCCCCCA CGGAGCGGTG CTTCTCCTTG CGCATGAAGA GTACGCTCAC
351 CAGCCGCGGG CGCACCTCA ACCTCAAGGC GGCCACCTGG AAGGTGCTGA
401 ACTGCTCTGG ACATATGAGG GCCTACAAGC CACCTGCGCA GACTTCTCCA
451 GCTGGGAGCC CTGACTCAGA GCCCCGCTG CAGTGCCTGG TGCTCATCTG
501 CGAAGCCATC CCCCACCCAG GCAGCCTGGA GCCCCACTG GGCCGAGGGG
551 CCTTCCTCAG CCGCCACAGC CTGGACATGA AGTTCACCTA CTGTGACGAC
601 AGGATTGCAG AAGTGGCTGG CTATAGTCCC GATGACCTGA TCGGCTGTTC
651 CGCCTACGAG TACATCCACG CGCTGGACTC CGACGCGGTC AGCAAGAGCA
701 TCCACACCTT GCTGAGCAAG GGCCAGGCAG TAACAGGGCA GTATCGCTTC
751 CTGGCCCGGA GTGGTGGCTA CCTGTGGACC CAGACCCAGG CCACAGTGGT
801 GTCAGGGGGA CGGGGCCCCC AGTCGGAGAG TATCGTCTGT GTCCATTTTTT
851 TAATCAGCCA GGTGGAAGAG ACCGGAGTGG TGCTGTCCCT GGAGCAAACG
901 GAGCAACAAT CTGCGAGACC CATTCAGCGG GGCGCCCCCT CTCAGAAGGA
951 CACCCCTAAC CCTGGGGACA GCCTTGACAC CCCTGGCCCC CGGATCCTTG
1001 CCTTCCTGCA CCGCCTTCC CTGAGCGAGG CTGCCCTGGC CGCTGACCCC
1051 CGCCGTTTCT GCAGCCCTGA CCTCCGTCGC CTCCTGGGAC CCATCCTGGA
1101 TGGGGCTTCA GTAGCAGCCA CTCCCAGCAC CCCGCTGGCC ACACGGCACC
1151 CCCAAAGTCC TCTTTCGGCT GATCTCCCAG ATGAACTACC TGTGGGCACC
1201 GAGAATGTGC ACAGACTCTT CACCTCCGGG AAAGACACTG AGGCAGTGGA
1251 GACAGATTTA GATATAGCTC AGGATGCTGA TGCTCTGGAT TTGGAGATGC
1301 TGGCCCCCTA CATCTCCATG GATGATGACT TCCAGCTCAA CGCCAGCGAG
1351 CAGTACCCA GGGCCTACCA CAGACCTCTG GGGGCTGTCC CCCGGCCCCG
1401 TGCTCGGAGC TTCCATGGCC TGTACCTCC AGCCCTTGAG CCCTCCCTGC
1451 TACCCGCTG GGGGAGTGAC CCCC GGCTGA GCTGCTCCAG CCCTTCCAGA
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1551 GGCCAGAGC TCAGAGGACG AGGACGAGGG AGTGGAGCTG CTGGGAGTGA
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1651 CCTCTCAGCC TGAGTTTCTT TCTGACAGGA GGACCAGCCC CAGGGAGCCT
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1751 CCATTCTAGA CCCCTACCCT CTAGGCTGTG CTGCTCCTGG ACTTCATGCC
1801 TCTCCATTCT CATTGCCTAC AATCTCTGTG CCCCAGAAC CCCTCCACTT
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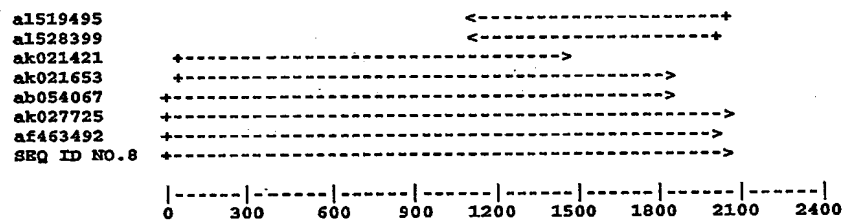
**Fig. 20: Schematic assembly of SEQ ID NO. 6,
with human ESTs and
human mRNA (AK021421)**



**Fig. 21: Schematic assembly of SEQ ID NO. 7,
with human ESTs and
human mRNA (BC026308)**



**Fig. 22: Schematic assembly of SEQ ID NO. 8,
with human ESTs and
human mRNAs (AK021421, AK021653,
AK027725, AB054067, AF463492)**



**Fig. 23: Schematic assembly of SEQ ID NO. 9,
with human ESTs and
human mRNA (AKO 21653)**

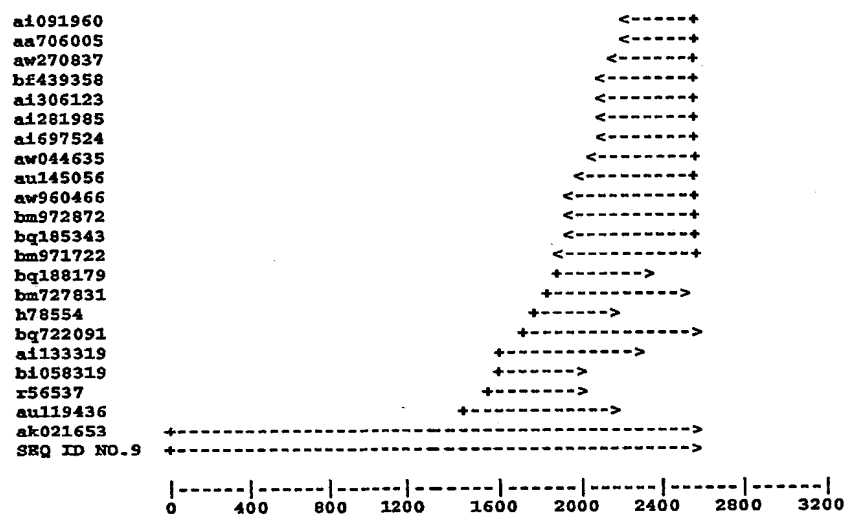


Fig. 24: Identification of differentially expressed genes by microarray hybridization

Biochip	Type of probe	Used probes (Cy5-/Cy3-labeled)	Ratio fluorescence intensity: temporal / frontal cortex
1	C	$PT_{SSH(2)} / PF_{SSH(1)}$	1.40
2	B	PT / PF	1.19
3	A	PT / PF	0.65
4	C	$PT_{SSH(4)} / CT_{SSH(3)}$	0.65
7	B	CF / PF	0.95

Fig. 25 :

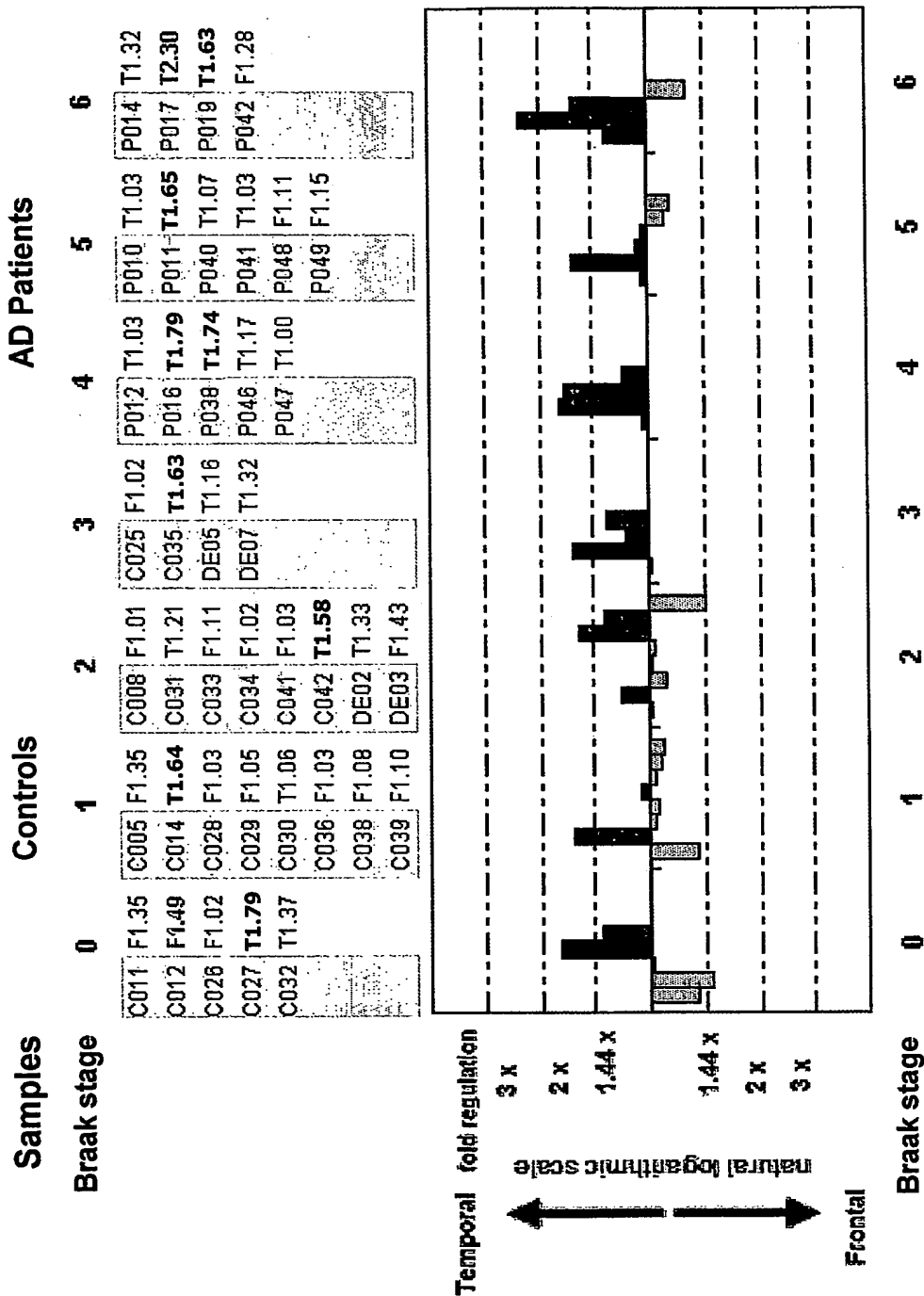


Fig. 26 :

sample	Δ (fold) (hippocampus / frontal cortex)
control C005	0.65
control C008	1.13
control C004	1.55
patient P012	1.68
patient P016	1.13
patient P010	0.70
patient P011	1.59
patient P014	1.30
patient P019	2.46

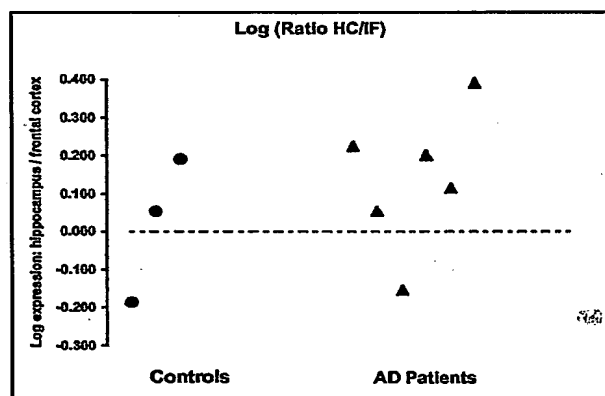


Fig. 27 :

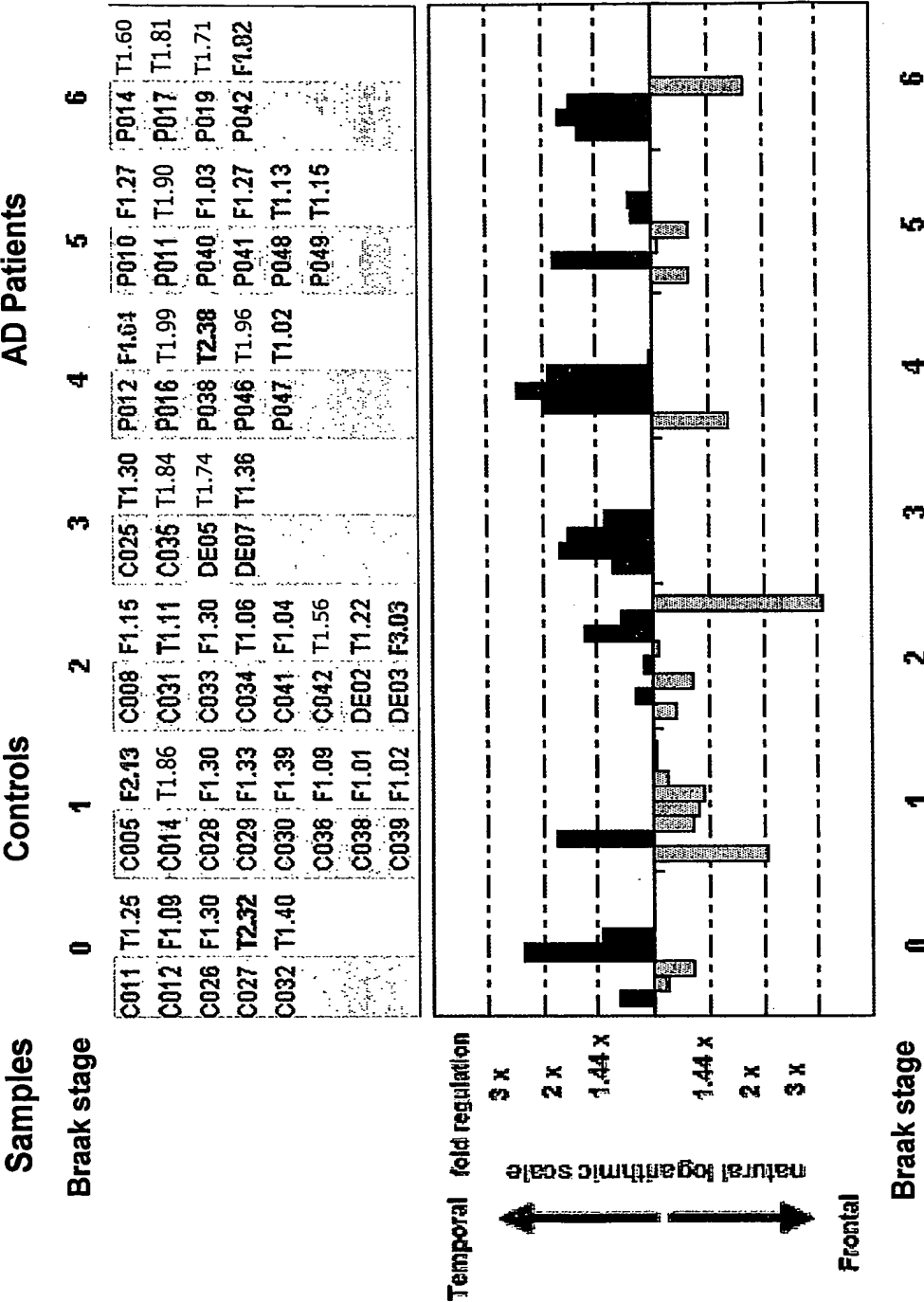


Fig. 28 :

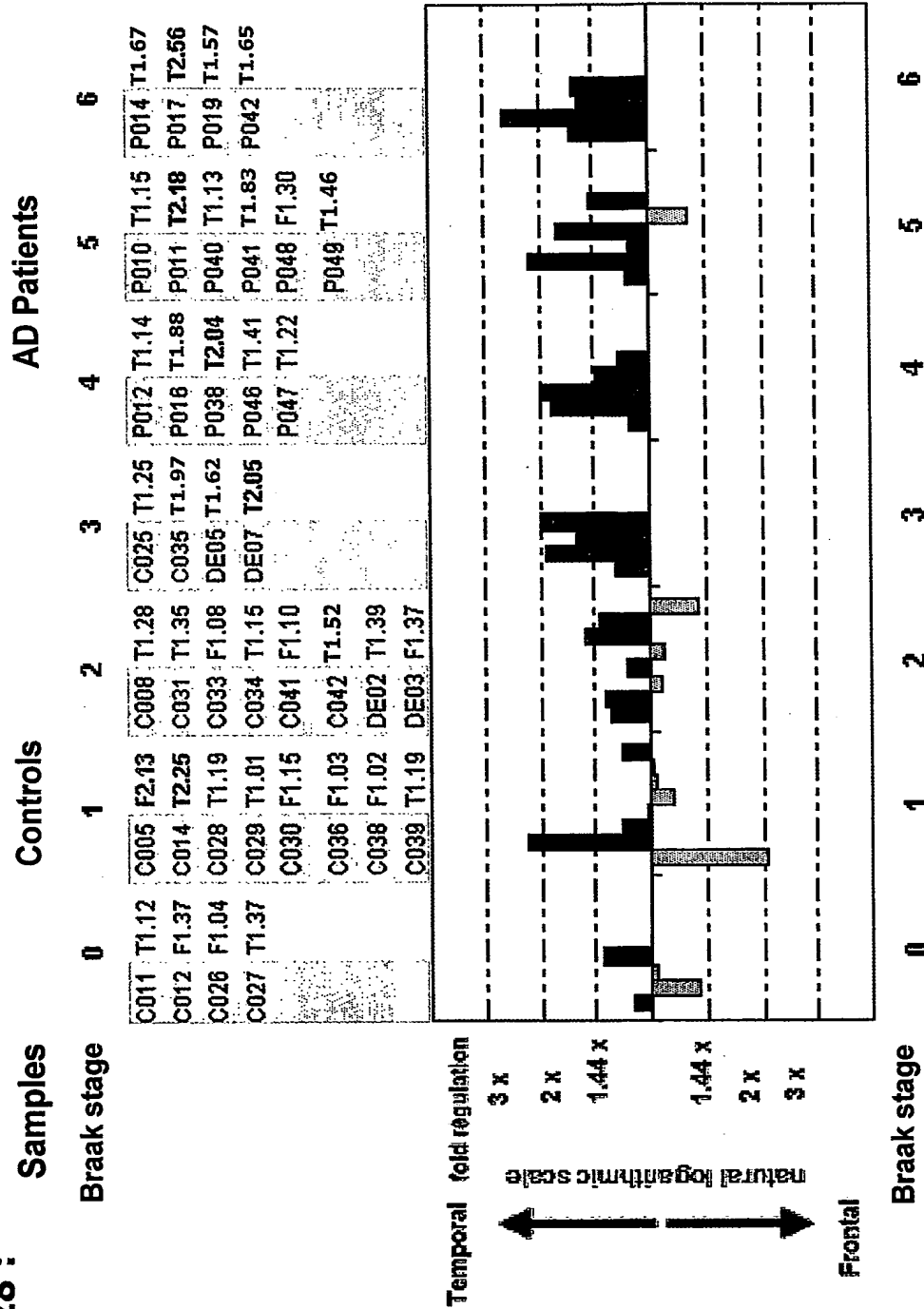


Fig. 29 :

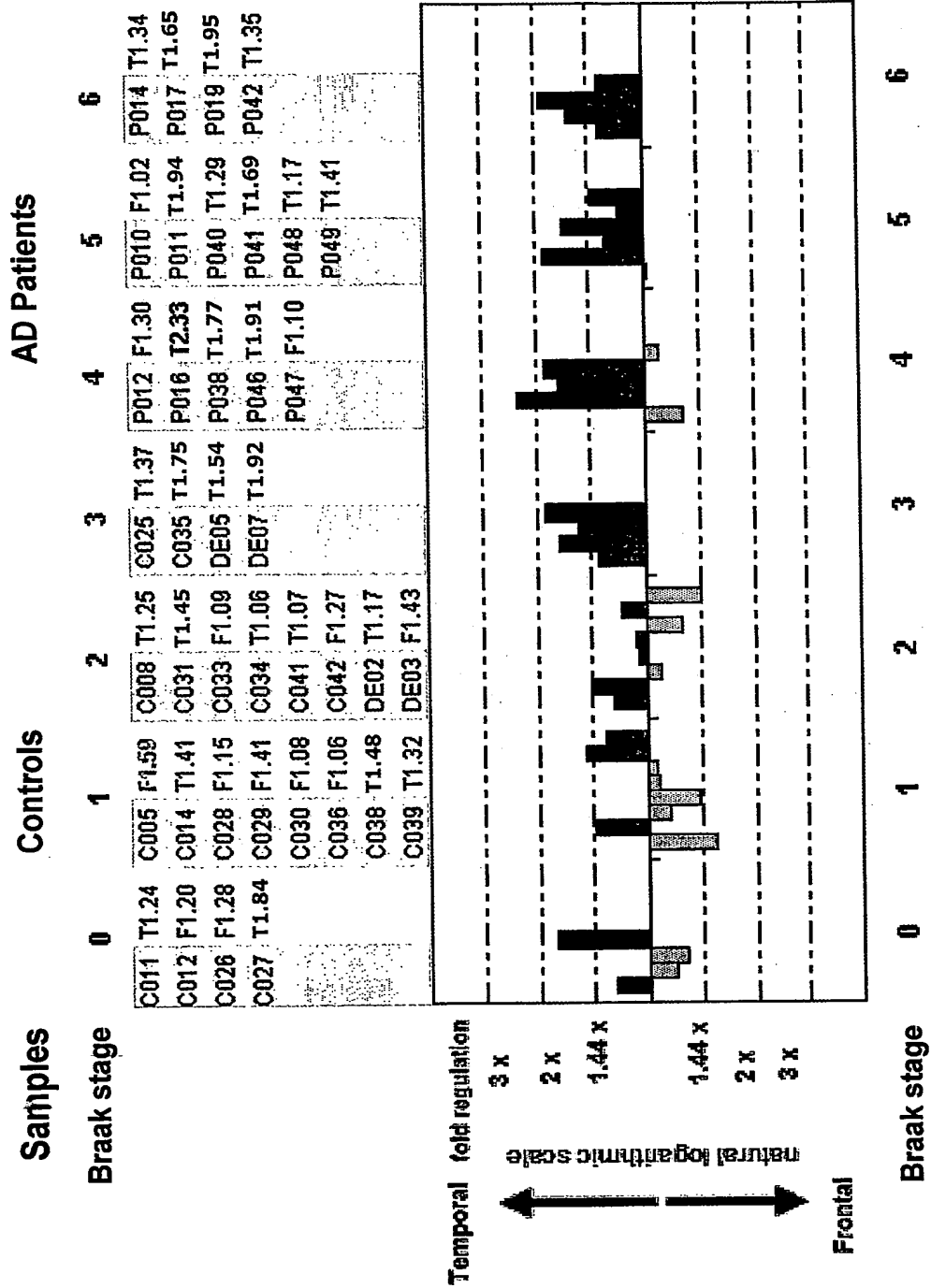


Fig. 30: Analysis of absolute mRNA expression of HIF3alpha splice variant 1

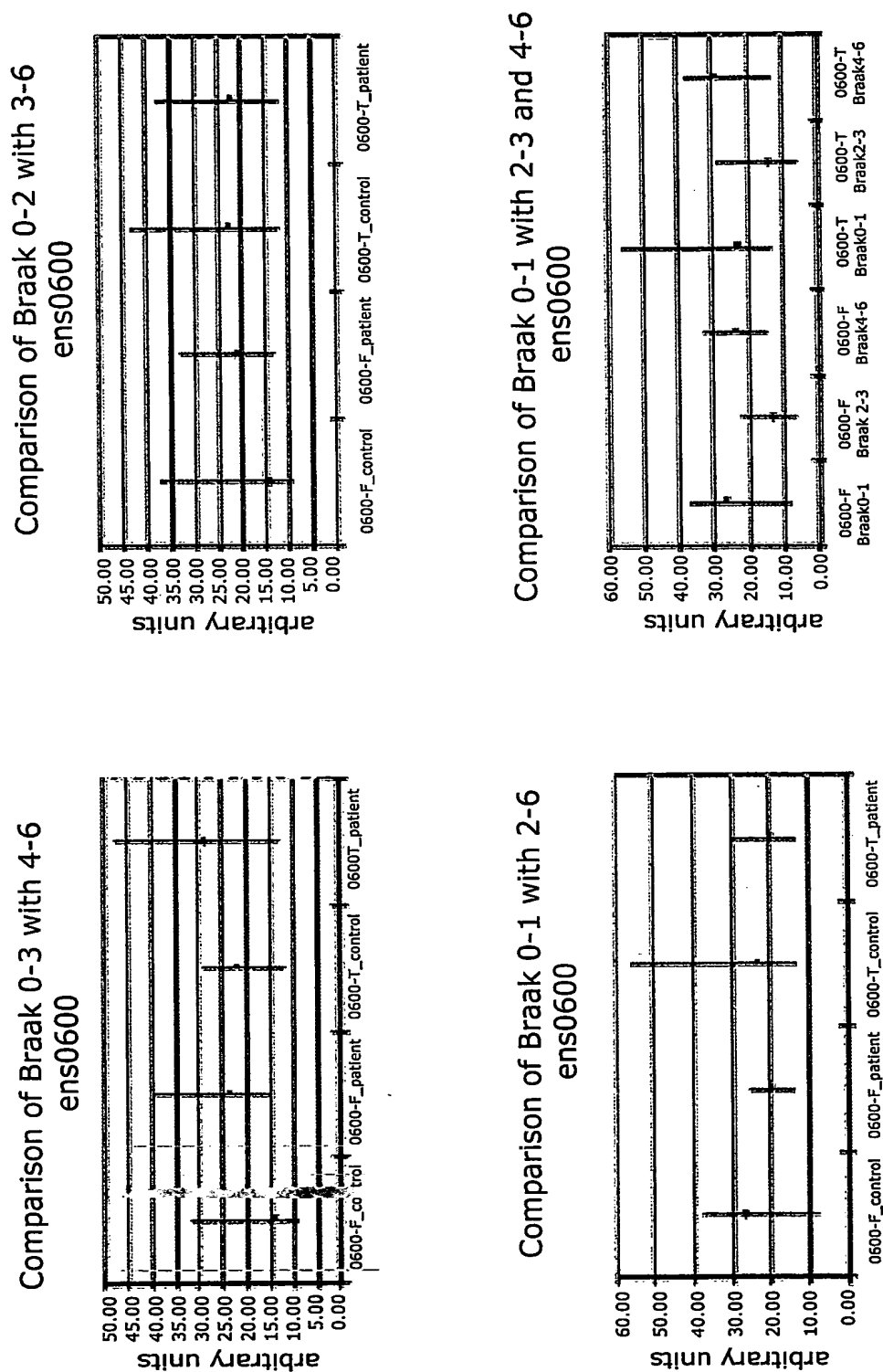


Fig. 31: Analysis of absolute mRNA expression of HIF3alpha splice variant 2

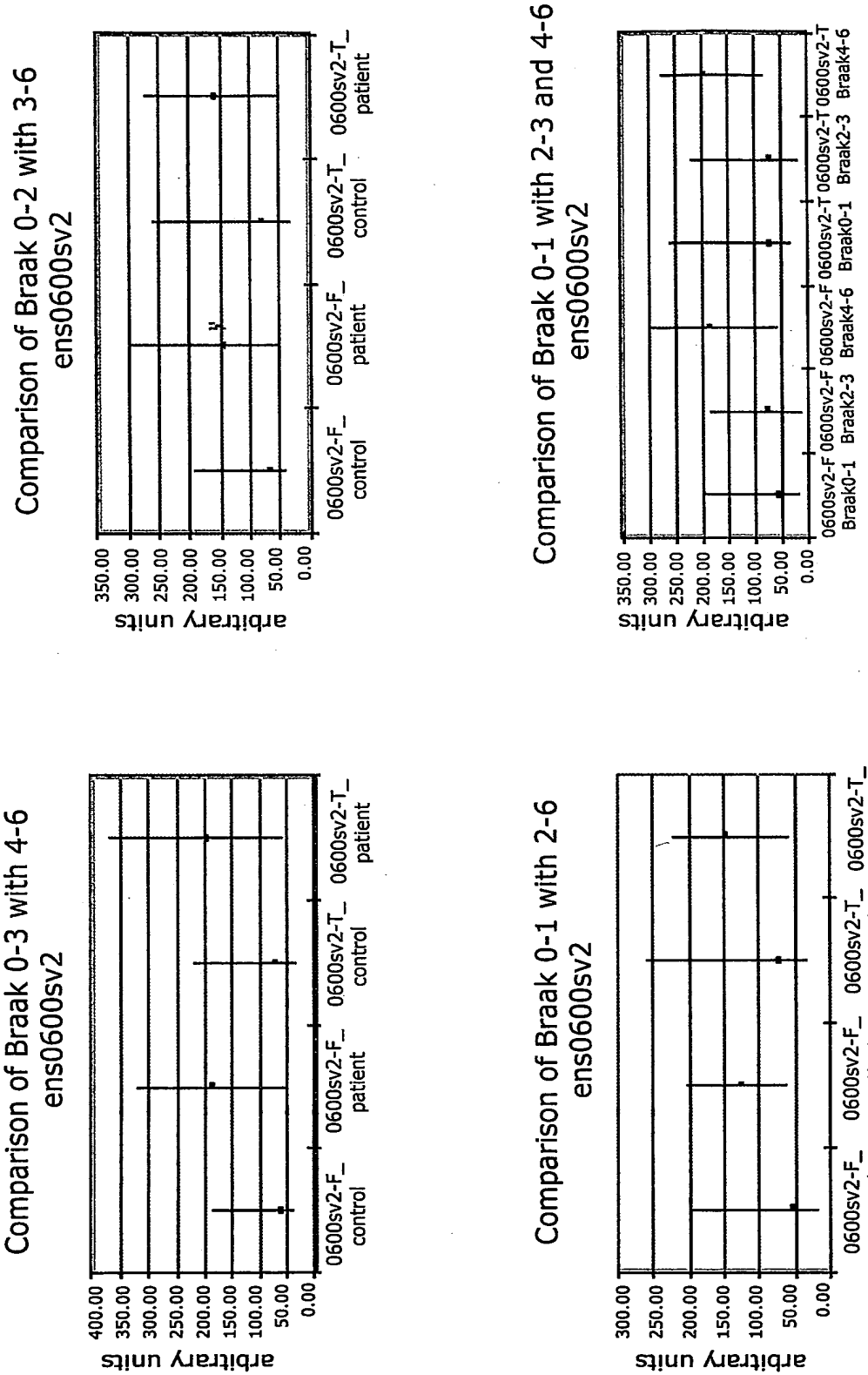


Fig. 32: Analysis of absolute mRNA expression of HIF3alpha splice variant 3

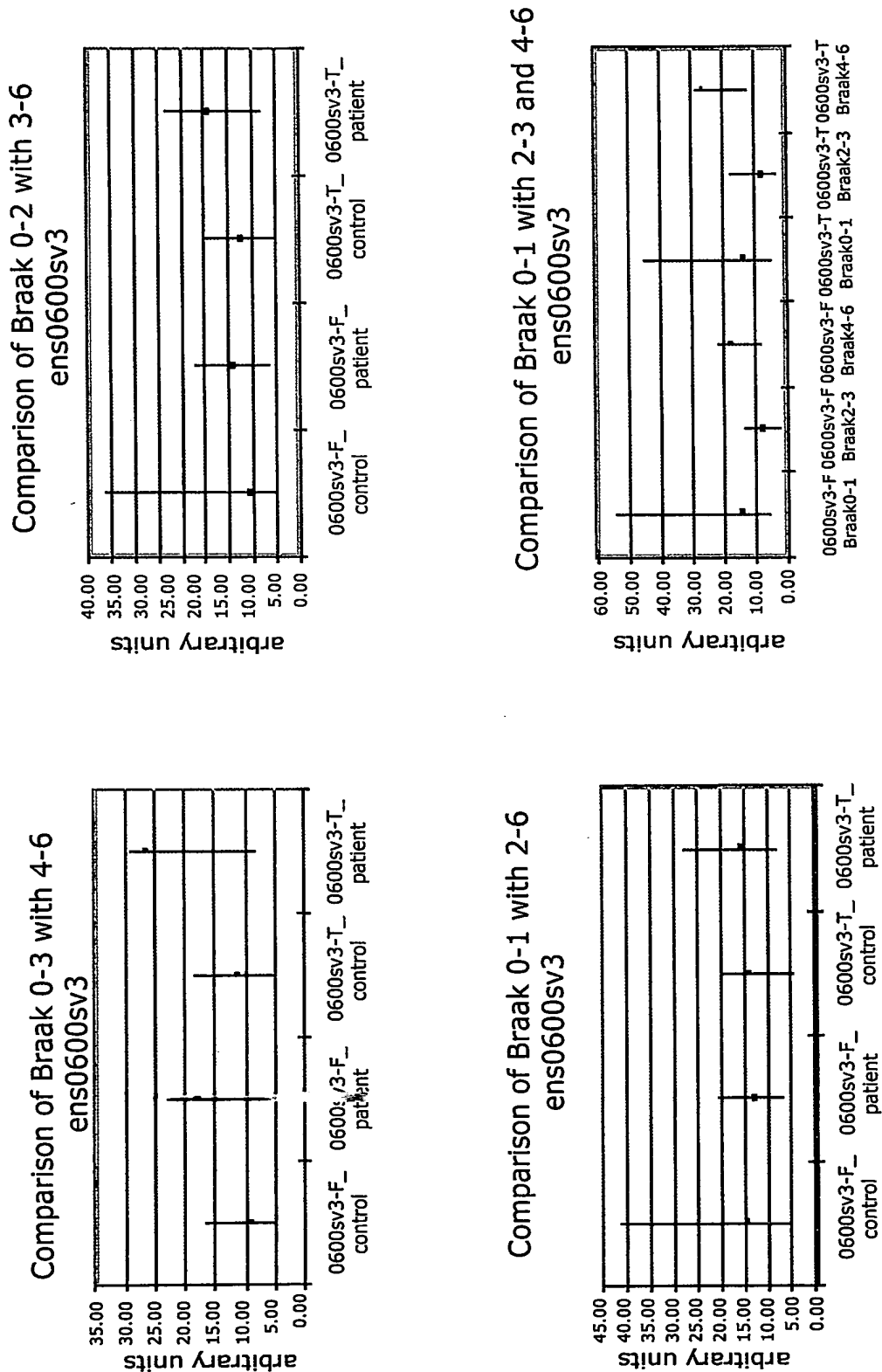
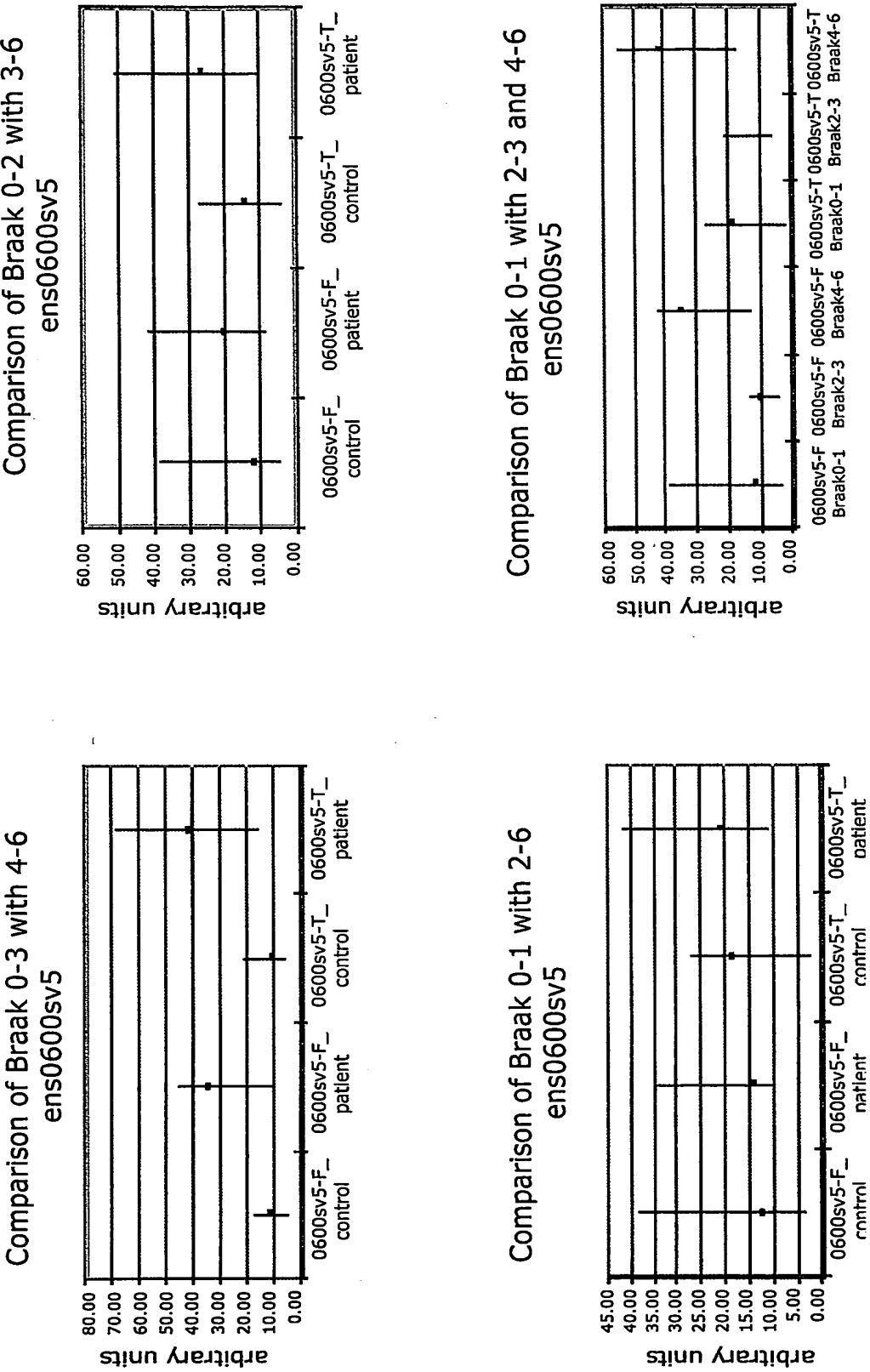
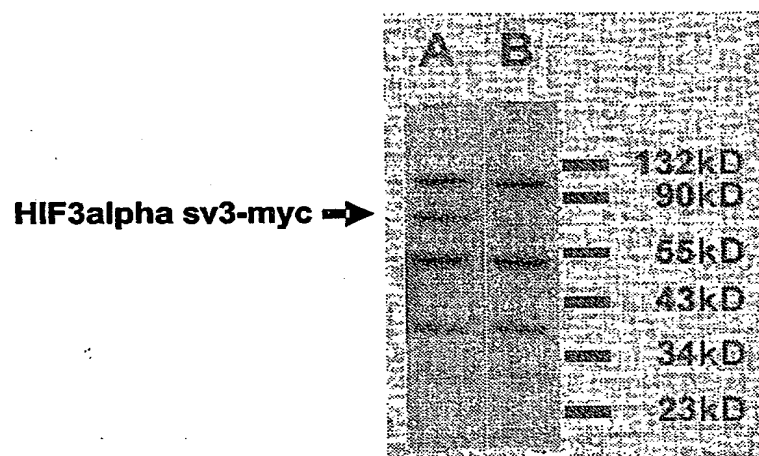


Fig. 33: Analysis of absolute mRNA expression of HIF3alpha splice variant 5



**Fig. 34: Western Blot of H4APPsw cell protein extracts
labeled with anti-HIF3alpha sv3-myc antibodies**



**Fig. 35: Immunofluorescence analysis of
HIF3alpha sv3 protein in neuroglioma cells**

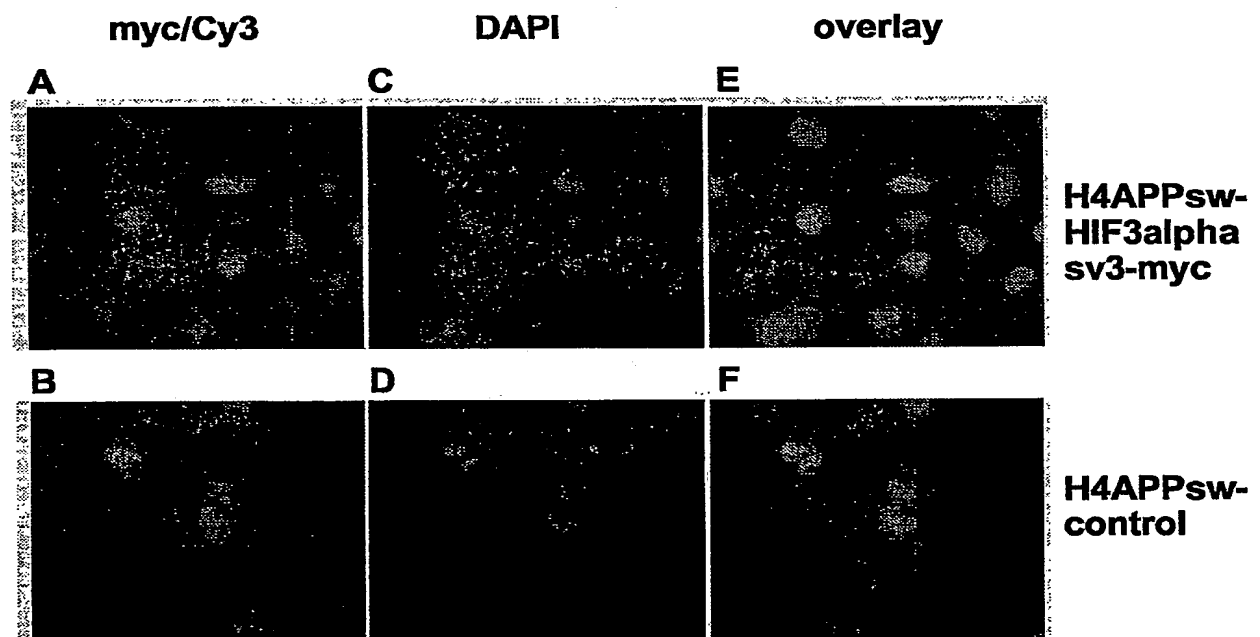


Fig. 36: Images of human brain sections labeled with anti-HIF3a antiserum, cell specific markers and DAPI

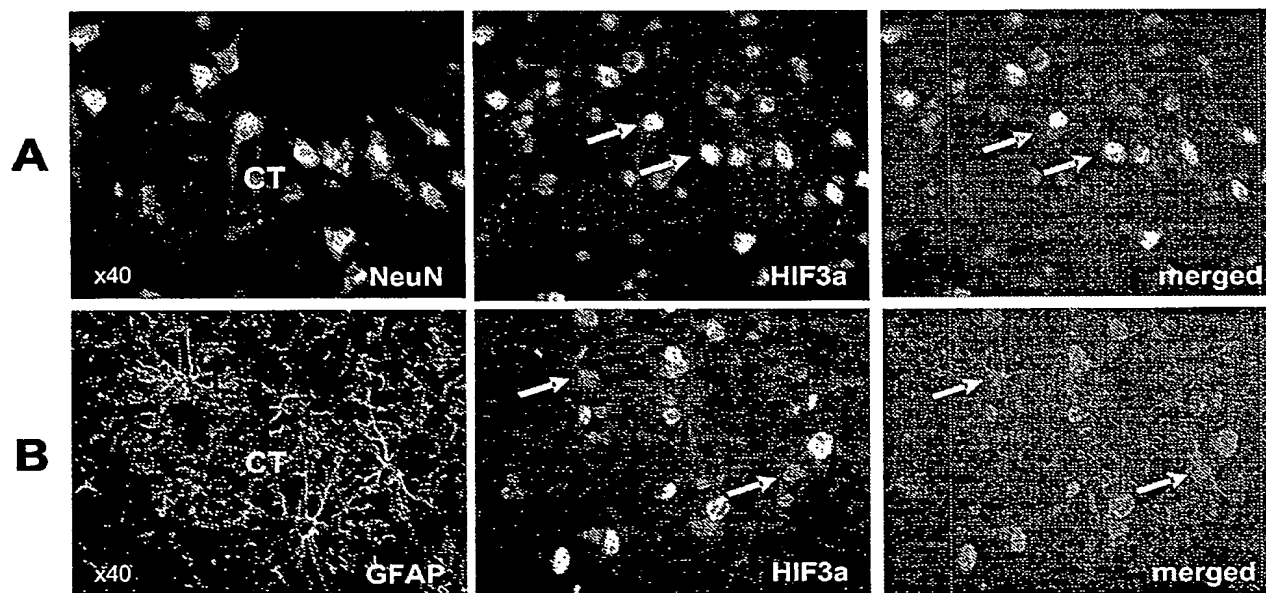
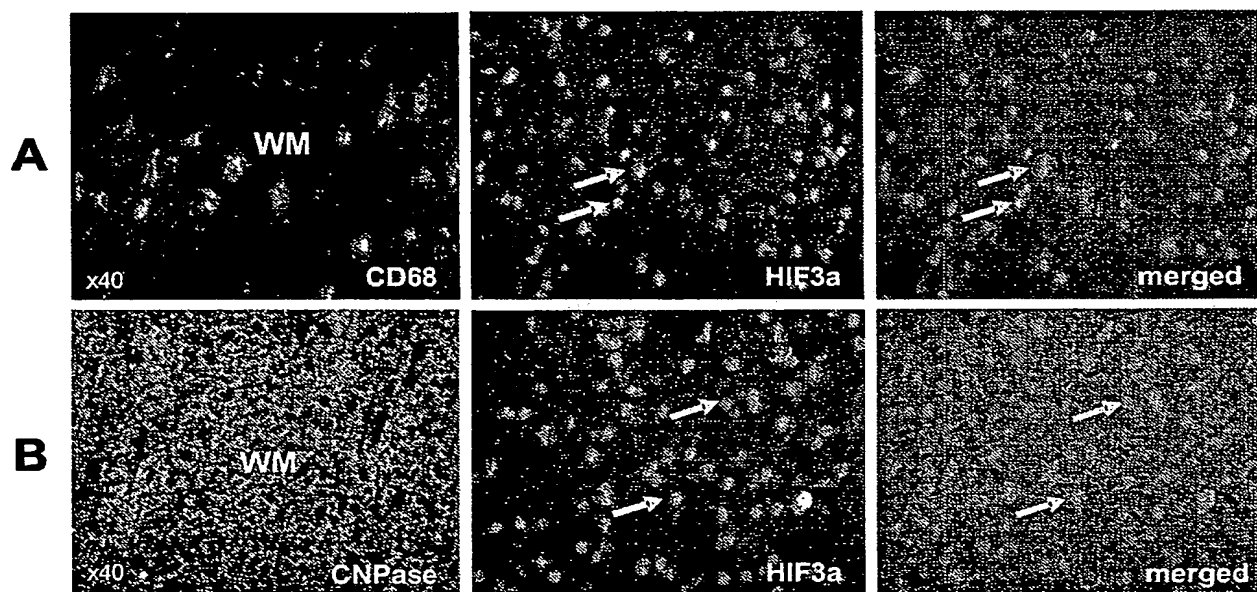


Fig. 37: Images of human brain sections labeled with anti-HIF3a antiserum, cell specific markers and DAPI



**Fig. 38 : Images of human brain sections labeled
with anti-HIF3a antiserum, GFAP and DAPI**

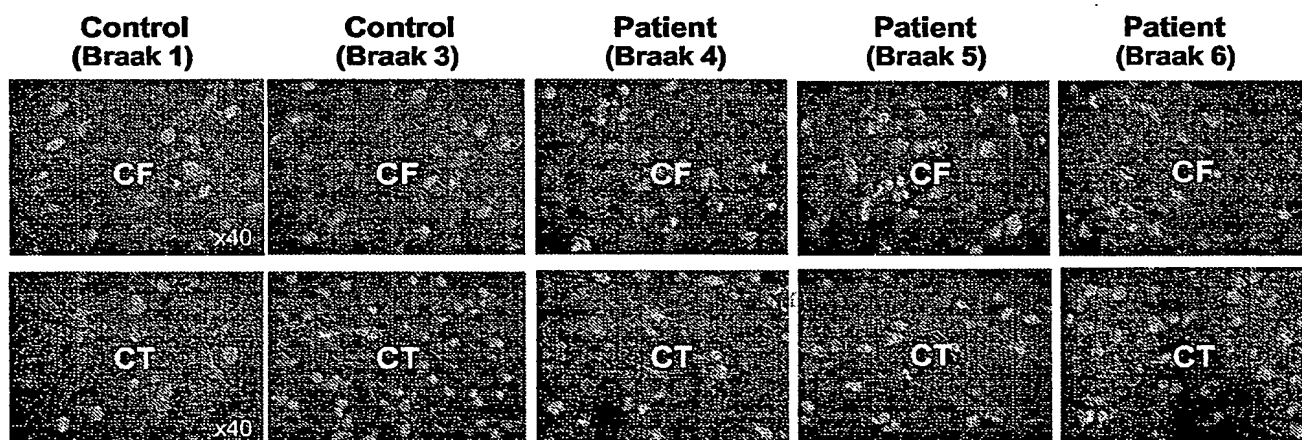


Fig. 39: Expression level of HIF3a sv3 expressing transgenic flies

name	cycle number	mean	stdev	error %	factor [normalization to rp49 cycle number]	mean*factor	difference	expression normalized to housekeeping gene and efficiency of HIF3a-sv3 primer	summary
HIF3a-sv3#3	30.03	30.237	0.2155	0.71265776	1	30.2366667			HIF3a-sv3#3 is 2.8 times higher expressed than HIF3a-sv3#4
HIF3a-sv3#3	30.22								
HIF3a-sv3#3	30.46								
HIF3a-sv3#4	30.96	31.160	0.1778	0.67046745	1.010625538	31.4910917	-1.25442502	-2.847544799	
HIF3a-sv3#4	31.22								
HIF3a-sv3#4	31.30								
HIF3a-sv3#57	27.84	27.953	0.1060	0.37915843	1.043347488	29.1650401	1.07162656	2.432592298	HIF3a-sv3#57 is 2.4 times higher expressed than HIF3a-sv3#3 and 5.3 times higher than HIF3a-sv3#4
HIF3a-sv3#57	27.97								
HIF3a-sv3#57	28.05						-2.32605158	-6.280137096	

$E = 10^{(-1/\text{slope})}$ slope = -2.806 $E = 2.27$ HIF3a-sv3 primer pair

name	rp49 cycle #	mean	stdev	error %	factor
HIF3a-sv3#3	19.63	19.657	0.0929	0.47269323	1
HIF3a-sv3#3	19.76				
HIF3a-sv3#3	19.58				
HIF3a-sv3#4	19.59	19.450	0.1929	0.99163504	1.010625538
HIF3a-sv3#4	19.23				
HIF3a-sv3#4	19.63				
HIF3a-sv3#57	18.97	18.840	0.1300	0.69002123	1.043347488
HIF3a-sv3#57	18.71				
HIF3a-sv3#57	18.84				

Fig. 40: Nuclear localization of HIF3a sv3 in transgenic Drosophila

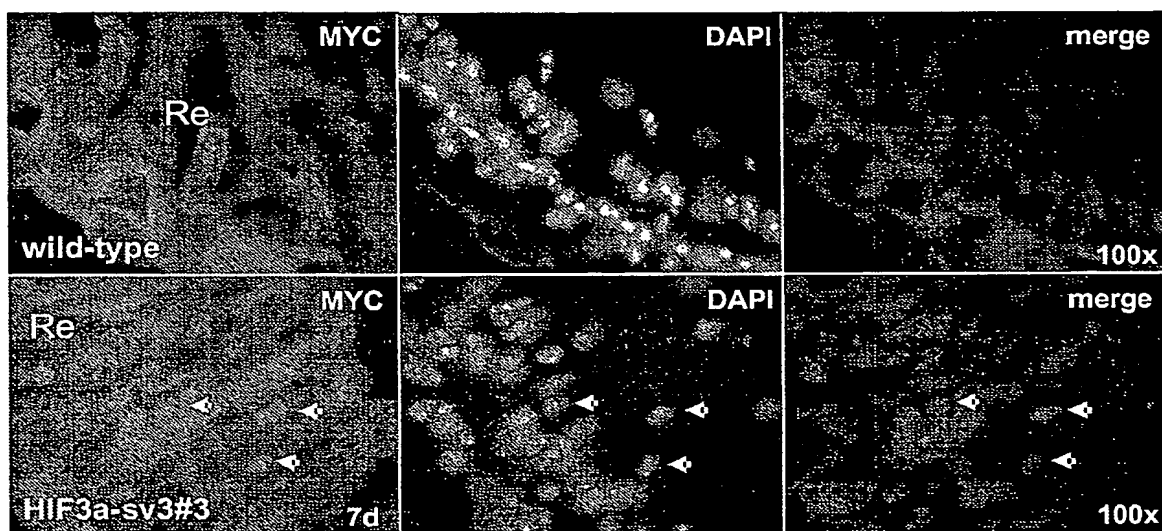


Fig. 41: HIF3a sv3 protein expression in transgenic flies

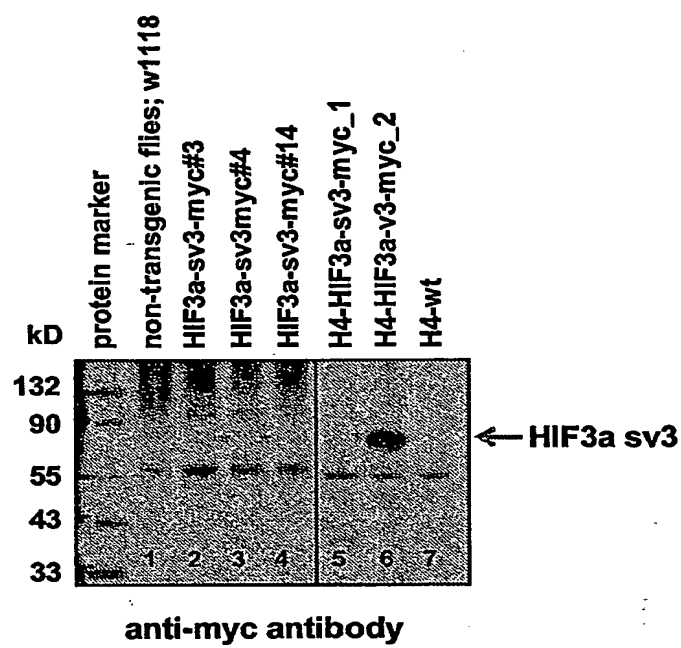


Fig. 42: HIF3a sv3 expression rescues photoreceptor cell degeneration

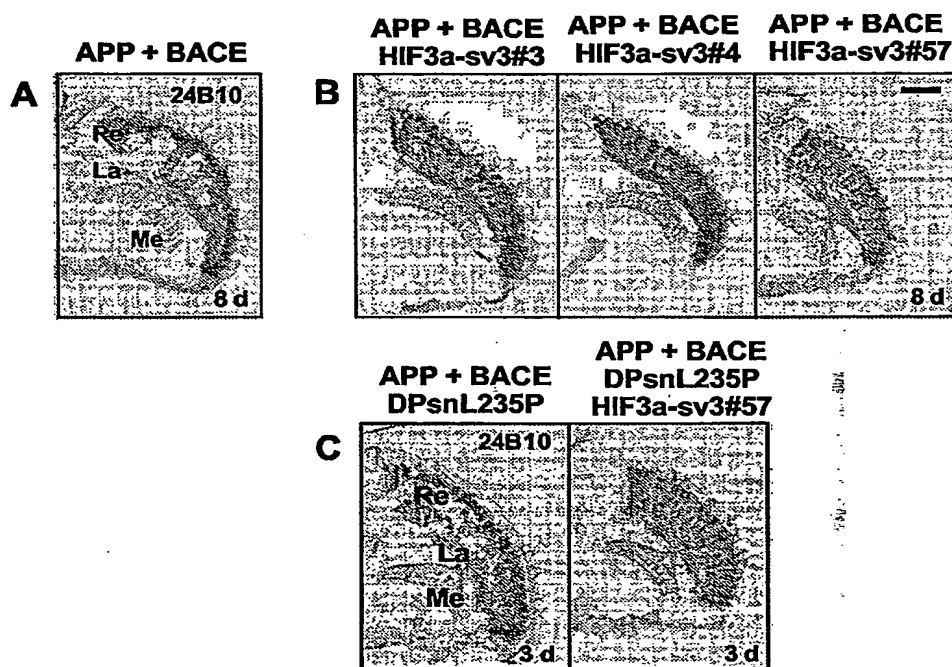
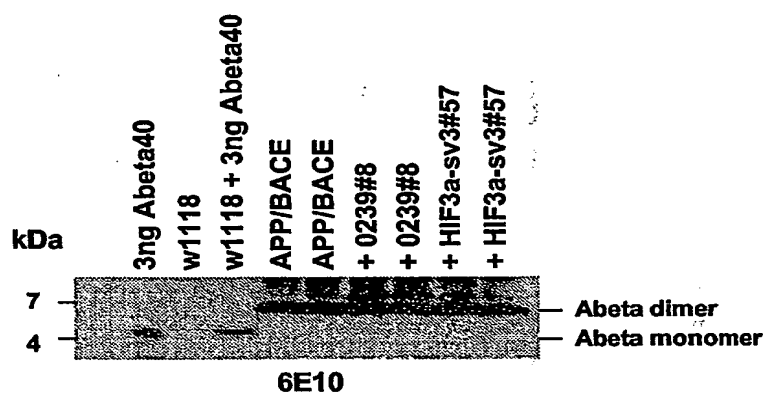
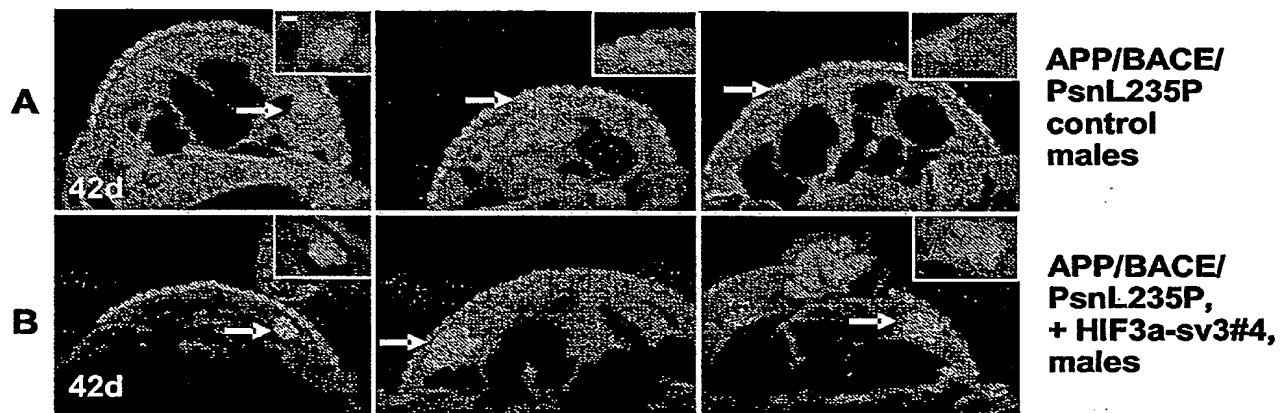


Fig. 43: Abeta level in hAPP/hBACE/HIF3a sv3 protein expressing flies



**Fig. 44: Abeta plaque deposition in
hAPP/hBACE/HIF3a sv3 expressing flies**



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